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CHICAGO ORCHARD (DOUGLAS) AIRPORT

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ity of Chicago

ARTIN H. KENNELLY, MAYOR

MASTER PLAN

of

CHICAGO ORCHARD
(Douglas)
AIRPORT

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Prepared for

CITY OF CHICAGO

Martin H. Kennelly
Mayor

John J. Duffy
Chairman
Committee on Finance

Theron W. Merryman
Chairman
Committee on Aviation

by

Ralph H. Burke
Airport Consultant

January, 1948

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MASTER PLAN

of

CHICAGO-ROCKFORD
(Rockford)
AIRPORT

Prepared for

CITY OF CHICAGO

Martin H. Kennelly
Mayor

John J. Duffy Chairman Commissioner of Finance	Thomas W. Sheridan Chairman Committee on Finance

by

Peter H. Burke
Airport Consultant

January, 1946

C H I C A G O O R C H A R D (D O U G L A S)
A I R P O R T

REPORT ON MASTER PLAN AND STAGE DEVELOPMENT

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REPORT OF MOVING PLAN AND TRADE NEGOTIATIONS

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R A L P H H. B U R K E
CONSULTING ENGINEER
20 North Wacker Drive
Chicago 6, Illinois

Dearborn 6071

March, 1948

Honorable Martin H. Kennelly
Mayor, City of Chicago

Dear Mayor Kennelly:

In Part I of this report, the present and future air transport needs of Chicago were set forth, the preliminary steps which have led to crystalizing the thought on airport planning were outlined, and the conclusions of an intensive study of the problem by the City and other planning agencies were stated.

A Master Plan for the Chicago Orchard (Douglas) Airport was presented; a plan, which, through its stages of construction, is geared to the present and forseeable needs of aviation, but which also is capable of ultimate expansion to meet the ever-growing demands of air commerce.

The basic elements of the design, including the area needed for the airport, the runway pattern and the arrangement of terminal facilities were shown and the general principles of the financial structure of the project were outlined.

Part I, therefore, presented a general picture of the accepted solution of the major airport problem of Chicago.

In Part II, there is assembled the technological data upon which are based the conclusions of the airport study. It contains the detailed information in drawings, charts and tabulations from national and local studies which have a bearing on the subject. It includes analyses of the volume and character of the airport operations, estimates of capital and operating costs and anticipated income both from flying and non-flying sources. It also covers details of the financial structure required to meet capital costs with a suggested schedule of revenue bond financing to supplement the expenditures of public funds for the project.

Part II, therefore, serves the purpose of adding to the general picture, the detailed information upon which the technical, financial and administrative agencies may act to bring to realization the Chicago Orchard (Douglas) Airport.

Respectfully submitted,

Ralph H. Burke

RHB:SA

Airport Consultant

RALPH H. BURKE
CONSULTING ENGINEER
20 North Wacker Drive
Chicago 6, Illinois

January 6th, 1946

Honorable Martin H. Kennelly
Mayor, City of Chicago

Dear Mayor Kennelly:

In Part I of this report, the present and future air transport needs of Chicago were set forth, the preliminary steps which have led to expediting the change on airport planning were outlined, and the conclusions of an intensive study of the problem by the City and other planning agencies were stated.

A Master Plan for the Chicago Overhead (Douglas) Airport was presented, which, through its stages of construction, is geared to the present and foreseeable needs of aviation, but which also is capable of adaptation to meet the ever-growing demands of air commerce.

The basic elements of the design, including the runs needed for the airport, the runway pattern and the arrangement of terminal facilities were shown and the general principles of the financial structure of the project were outlined.

Part I, therefore, presented a general picture of the accepted solution of the major airport problem of Chicago.

In Part II, there is assembled the technological data upon which are based the conclusions of the airport study. It contains the detailed information in drawings, charts and tabulations from national and local sources which bore a bearing on the subject. It includes analyses of the volume and character of the airport operations, estimates of capital and operating costs and anticipated income both from flying and non-flying sources. It also covers details of the financial structures required to best capital costs with a supplemental schedule of revenue bond financing to supplement the expenditures of public funds for the project.

Part II, therefore, serves the purpose of adding to the general picture, the detailed information upon which the technical, financial and administrative approaches may act to bring to realization the Chicago Overhead (Douglas) Airport.

Respectfully submitted,

Ralph H. Burke
Airport Consultant

PART I

R A L P H H. B U R K E
CONSULTING ENGINEER
20 North Wacker Drive
Chicago 6, Illinois

Dearborn 6071

January, 1948

Honorable Martin H. Kennelly
Mayor, City of Chicago

Dear Mayor Kennelly:

Submitted herewith is a resume of Chicago's Master Airport Plan. Studies conducted during the past year have resulted in the development of a plan which meets the full approval of the governmental agencies and the commercial organizations which together must finance and operate the new Chicago Orchard (Douglas) Airport.

The plan envisions a brilliant future for Chicago as the airport center of the world. It provides adequately for the maximum ultimate growth and at the same time permits a stage construction to match that growth. Centered around convenience to the public, it embodies revenue-producing features designed to make it self-supporting.

Initial exploration of Chicago's Airport problem by the Chicago Plan Commission, the Chicago Regional Planning Association and the Chicago Association of Commerce followed by later studies of the Economic Advisory Council led to the appointment of the Airport Site Selection Board, headed by Mr. Merrill C. Meigs, Chairman, Chicago Aero Commission. Subsequently, the Douglas site was recommended and adopted.

Technical studies advanced through a series of conferences with representatives of Federal, State and City agencies, the scheduled airlines serving Chicago, and related organizations.

The Regional office of the Civil Aeronautics Administration, of which Mr. George W. Vest is Administrator and Mr. Lane Wilcox is Superintendent, Airports Branch, contributed greatly to the technical and financial studies. Gov. Dwight Green has expressed the interest of the State of Illinois in the Chicago Airport project and the State Department of Aeronautics directed by Mr. Robert Dewey has participated in the studies.

Experts on technical and managerial problems were assigned by the scheduled airlines - G. R. Kennaday, American; R. M. Lewis, Braniff; F. M. Moss, Capital; R. S. Maurer, Chicago and Southern; M. D. Kochman, Delta; C. P. Bolles, Eastern; F. R. Meisch, Northwest; C. M. Kneisel, Pan American; H. B. Aikin, Trans-Canada; B. C. Rathbone, Trans-World. These men organized into two groups - the Chicago Terminal Building Committee of which Mr. A. F. Heino, United, is Chairman, and the Airline Technical Committee headed by Mr. E. P. Lott, also of United. During regular meetings held in Chicago by these committees, additional experience and knowledge was contributed to

R A L P H R. G U E R E Y
COORDINATING CONSULTANT
50 North Wacker Drive
Chicago 6, Illinois

Chairborne Hoyt

January, 1948

Honorable Martin E. Donnelly
Mayor, City of Chicago

Dear Mayor Donnelly:

Enclosed herewith is a resume of Chicago's Master Airport Plan. Overtime consultation during the past year have resulted in the development of a plan which meets the full approval of the governmental executive and the commercial organizations using Chicago and operating the key Chicago (Douglas) Airport.

The plan envisions a brilliant future for Chicago as the strategic center of the world. It provides especially for the maximum utilization of the same time periods a sharp concentration in medium haul private, business aircraft conveniences on the ground, in modern terminal operating features designed to make it self-supporting.

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The Regional Office of the Civil Aeronautics Administration, of which Dr. George W. Tait is Administrator and Mr. Lee Nilson is Engineering Assistant, Airports Service, contributed greatly to the technical and financial studies. Mr. Dwight Green has expressed the interest of the Governor of Illinois in the Chicago Airport project and the Illinois Department of Aeronautics directed by Mr. Robert Denny has participated in the studies.

Experts on technical and managerial problems were retained by the combined airlines - C. R. Smith, American; E. Rickenbacker, Eastern; T. E. Mac, United; H. S. Adams, Northwest and Southern; R. T. Damon, Delta; C. Paine, Western; R. R. Prince, Continental; C. E. Beebe, Pan American; E. E. Aldin, Trans-Canada; R. C. Babcock, Trans-World. These men organized into two groups - the Chicago Terminal Building Committee of which Mr. A. T. Stolz, United, is Chairman, and the Airline Technical Committee headed by Mr. E. P. Lott, also of United. During regular meetings held in Chicago by these committees, additional experience and knowledge was contributed to

the airport planning by the Air Transport Association in the person of Mr. John Groves, and by a representative of the Airlines National Terminal Service Corp., Mr. E. H. Sittner.

Thus, through the combined efforts of all concerned, Chicago's Master Plan is ready for action.

A future report on this subject will embrace the technical data, details of study and estimates of capital costs and financing which have led to the adoption of the Master Plan for the Chicago Orchard (Douglas) Airport.

Respectfully submitted,

Ralph H. Burke

RHB:SA

Airport Consultant

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Thus, through the combined efforts of all concerned, Chicago's Master Plan is ready for action.

A future report on this subject will embrace the technical data, details of study and estimates of capital costs and financing which have led to the adoption of the Master Plan for the Chicago Terminal (Douglas) Airports.

Respectfully submitted,

Airport Commissioner

EDB:EM

CHICAGO ORCHARD (DOUGLAS) AIRPORT

GROWTH

The remark is common today that "Aviation is in its infancy." This is, of course, true since practically its entire development has occurred since the turn of the century. During the early years, the inventor groped into the unknown to determine principles of flying. In World War I, young heroes fought spectacular air duels in suicide aircraft. In the years that followed, air mail service began to appear, strangely reminiscent of the pony express of pioneer years. Thus, commercial aviation was born.

In World War II, the airplane became the predominant force, both for attack, supply and defense. Combat planes directly engaged the enemy. Bombers broke up military installations and disrupted the sources of war supplies. Transports moved armies and kept the fronts supplied. In short, air superiority won the war.

If "Aviation is in its infancy," it is, nevertheless, a husky infant. Commerce today is geared to aviation. It depends on the saving of time in travel, in air mail and in air cargo made possible by commercial aviation.

The growth of aviation has been more rapid than that of any other form of transportation. This rapid growth is expected to continue until the economics of air traffic become stabilized in comparison with other modes of transportation; a period, probably, of 15 to 20 years. Aviation facilities and particularly airports must, therefore, be planned today to provide a flexibility for the future expansion which is sure to come.

RESPONSIBILITY

Adequate airport facilities are the concern first of the nation. A national system of airports is vital in war for the military

THE TOWN HOUSED (NATURAL) AIRPORT

Energy

The remains of common today that "Aviation is in the balance." This is, of course, true since essentially its modern developments has occurred when the cost of the crossing. During the early years, the tremendous gulped into the economic to fabulous politics of flying. It would as I, found before longer consequences air *bowls* in outside electric. In the years that followed, air mail service began to expand, strongly reminiscent of the post express of pioneer years. Then, commercial aviation was born.

In World War II, the airplane became the predominant force, both for attack, supply and defense. Combat planes literally changed the course. Bombers broke to military installations and disrupted the economy of Japan. Commercial cargo planes and tanker ships flew the Pacific supplies. Transports moved armies and kept the Pacific supplied. In short, the universally used the war.

If "Aviation is in the balance," it is, nevertheless, a handy balance. Commercial today is geared to aviation. It depends on the saving of time in travel, in air mail and in air cargo once possible by commercial aviation.

The growth of aviation has been more rapid than that of any other form of transportation. This rapid growth is accepted to continue until the economics of air traffic become established in competition with other modes of transportation, a period, probably, of 15 to 20 years. Aviation facilities and particularly airports must, therefore, be planned today to provide a flexibility for the future expansion which is sure to come.

Requirements

Adequate airport facilities are the economic first of the nation. A national system of airports is vital in war for the military

strength of the nation and in peace for international and interstate commerce.

Adequate airport facilities are also the concern of each State. The welfare of every community in the State is enhanced by a well-developed system of airports to provide ready communication for air traffic throughout the State.

Adequate airport facilities are primarily the concern of the community. Since aviation has become an integral part of industry and commerce, it follows that any community which aspires to industrial greatness, must provide airport facilities to keep pace with the ever-increasing demands of aviation.

The commercial air lines, the newer feeder line operators and the air cargo carriers are as well directly concerned with adequate airport facilities.

The National responsibility for airports is recognized in the Federal Airport Act. This legislation climaxed several years of effort on the part of municipalities to establish a long-range program of Federal Aid for construction of municipal airports. It provides for an appropriation of 500 million dollars for grants by the Civil Aeronautics Administration during a seven year period starting July 1, 1946 to municipal, state, or other local public agencies which sponsor and match Federal funds. Designed to promote a National airport plan, the Act, in general, authorizes the C.A.A. to finance 50% of the cost of public airports, although the Administrator is given discretion largely dictated by limitation of available funds to reduce the percentage of Federal grants on the larger airports.

The State of Illinois has been, and is, one of the leaders in its encouragement of aviation. State appropriations now exist to aid

in the encouragement of aviation. Those subscriptions are safe in all

The Duke of Illinois can boom, and he, one of the leaders

among of General Grants on the Indian airports.

creating largely diverted by limitation of available funds to reduce the per-

50% of the cost of public airports, although the Administration is firm in

a National airport plan, the Act, in general, authorizes the C.A.A. to disburse

public expenditure Nation wherein may exist federal funds. Designed to provide

a seven year, period operating July 1, 1946 to municipal, state, or other local

300 million dollars the grants by the Civil Aeronautics Administration during

the construction of municipal airports. It provides for an apportionment of

the part of municipalities to establish a long-range program of federal aid

federal airport act. This legislation allocated several years of effort on

facilities.

The National responsibility for airports is recognized in the

new six major carriers who do not directly concerned with commercial airport

of aviation.

The Government all these, the model Tender like operating the

most Florida airport facilities to help pace with the ever-increasing demands

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community. Since aviation has become an important part of industry and com-

the Duke.

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owners of airports to provide ready communication for air traffic throughout

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nation.

Legislation of the nation and to issue for improvement and preservation con-

local communities in the development of airport facilities.

The City of Chicago, by popular vote, has authorized funds for the creation of airport facilities to assure the continued pre-eminence of the City as the transportation center of the nation.

The commercial airlines have focused their attention on the needs of adequate airport facilities in Chicago and stand ready to assume their equitable share of this burden of meeting the future needs of aviation.

THE PROBLEM

Chicago faces the immediate necessity of expanding its airport facilities. The growth of passenger traffic has been phenomenal. Ten years ago - in 1936 - less than 100,000 passengers used the Municipal Airport. Last year - in 1946 - 2,500,000 passengers were handled in Chicago. Ten years hence - in 1956 - the passenger traffic is conservatively estimated at 12,000,000. Chicago must then possess the airport facilities to make this traffic possible.

Studies indicate that by 1951, 243,000 scheduled airplane movements and 90,500 feeder plane movements will be required to handle the anticipated yearly volume. In another 20 years, figures predict a total of 715,000 movements per year.

The plight of Chicago's present airport facilities and the necessity for long-range planning and immediate action followed long and careful study instituted in the closing years of World War II, an era in which aviation advanced faster than in all its previous history. It was this wartime acceleration of air traffic which pointed up the inadequacy of Chicago's Municipal Airport.

The Postwar Economic Advisory Council of Chicago started work on this problem in 1944. The members studies airport history, noting that

The Metropolitan Area Transportation Study, in its report on this problem in 1964, has examined airport history, noting that the accelerated expansion of air traffic which followed the inauguration of Chicago's municipal Airport.

The Northwest Economic Advisory Council of Chicago started work several study instituted in the closing years of World War II, an era in which aviation advanced faster than in all its previous history. It was this war-time acceleration of air traffic which pointed up the inadequacy of Chicago's facilities for long-range planning and immediate action followed long and bitter controversy over the location of the present airport facilities and the necessity for a new airport.

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The commercial airlines have focused their attention on the needs of adequate airport facilities in Chicago and stand ready to assume their equitable share of this burden of meeting the future needs of aviation.

THE PROBLEM

Chicago faces the immediate necessity of expanding the airport facilities. The growth of passenger traffic has been phenomenal. Ten years ago - in 1946 - less than 100,000 passengers used the Municipal Airport. Last year - in 1956 - 5,500,000 passengers were handled in Chicago. Ten years hence - in 1966 - the passenger traffic is conservatively estimated at 11,000,000. Chicago must then possess the airport facilities to make this traffic possible.

Studies indicate that by 1981, 815,000 scheduled airplane movements and 90,000 feeder plane movements will be required to handle the anticipated yearly volume. In another 20 years, figures predict a total of 15,000 movements per year.

The plight of Chicago's present airport facilities and the

the original air mail field for Chicago was located at suburban Maywood. Later a new airport was started on the site of the present Municipal Field with some runways on a quarter of a mile square area.

This has been developed to a square mile with dual runways in each of four directions giving Chicago at present an air field of much more capacity and of greater safety than is operated by any other large city. The Municipal Airport is capable of 120 movements per hour, either take-offs or landings. This capacity is one third of that required for Chicago air travel needs in the future.

CHOICE OF SITES

With the necessity for additional airport requirements established, the Airport Site Selection Board was appointed to consider the available sites. The board began with 10 sites in the Chicago area of which 5 were eliminated in the early stages of study. Those remaining for final study included the present Municipal, Calumet, Lake Michigan, Clearing and Douglas sites.

The possibility of enlarging Municipal airport was abandoned by the board when surveys showed the acquisition of the required additional land would be uneconomical inasmuch as residential and industrial properties formed the field's boundaries.

Calumet site was dropped from consideration since the available area was too small for the ultimate requirements of the principal passenger port and the nearby industrial area produced obscuring smoke and other navigational obstructions. A proposal to construct a principal Chicago airport in Lake Michigan also proved too costly. The board did not, however, eliminate the future possibilities of the Lake Front as an airport site.

Although the Clearing site, southwest of Chicago's business

district had many advantages, the disadvantages far outweighed them. Principal among these was the fact that Municipal airport, located in the same area, would have to be abandoned because of conflicts in air control patterns.

The selection board, after carefully weighing all possibilities, recommended Douglas, 18 miles northwest of the loop, as the site of Chicago's principal airport. This is the location of the Douglas aircraft plant and adjacent runways which served as an aircraft proving ground during World War II. It consisted of a nucleus of nearly 1400 acres of government owned property surrounded by acres of additional land available at a minimum of disruption to established facilities. The Douglas site also is adjacent to the line of the proposed Northwest express highway leading into Chicago.

The selection board's conclusion was unanimous that the Douglas site "is properly located, is of sufficient size, and is capable of being improved with runways, terminal building, and all needed accompanying facilities, so that it will serve with safety, all of the anticipated scheduled airline traffic, domestic and foreign, for at least 20 years."

The board's recommendation protected the present Municipal airport for continued use and noted the possible future need for "some form of a lake front airport."

SIZE OF SITE

One of the prominent factors considered before the final site was selected concerned the size and the shape of the airport. This involved an estimate of the volume of air travel in the foreseeable future, the probabilities of development beyond that point and an examination of the limitations any plan might impose on later developments.

In determining these factors, the Selection Board considered, among others, the forecasts of airline experts, made independently of each

of a Jane Doe signer."

The board's recommendation produced the largest mobilized
effort for contraband ever mounted the Peculiar Palace Land Fire "Jane Doe"
alpine reality, commonly dog Foreign, for at least 20 years."

Even if property lessees, if of multiple size, and is capable of being
Jefferson with towers, Imperial Building, and all needed accompanying facili-
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other, that 240 plane movements per peak hour must be provided for within 10 years.

The next move was to negotiate with the federal government, a course which resulted in acquisition, without cost, of 1080.60 acres of the existing Douglas or Chicago Orchard Airport, as it is officially known. The U. S. Army Air Forces retained 281.24 acres upon which are located the buildings of the Douglas plant for continued military use and as a storage depot. This was accomplished March 21, 1946.

The Selection Board's recommendations contained a warning to the City of Chicago that immediate action was imperative if Chicago was to retain its prominent position on the airways map of the world. To delay, the Board pointed out, would mean that Chicago would be passed up as a major air terminal center and perhaps never again have the opportunity now presented. Chicago responded by providing for an Airport Consultant, empowered to fully supervise all planning, designing, construction and, in short, all engineering required for fulfillment of Chicago's Master Airport Plan. Such a proposal, adopted in December, 1946, by the City Council, with the support of the Mayor, the Commissioner of Public Works, and others concerned with the airport problem, was found necessary as the only means wherein Chicago could execute the vast amount of work necessary to meet the time schedule and keep Chicago ahead in aviation.

RUNWAY PATTERN

At this stage, the technical planning for Chicago's principal airport began. With the need well-established, the planners began overlaying the requirements on all known airport designs. Determination of the type of runway pattern which would best adapt itself to the area chosen, was of paramount importance. Originally, this study included a plan of the typical

other, like 200 lines. Passengers per year must be provided for within
10 years.

The next move was to negotiate with the Federal Government, a
return visit required to negotiation without cost, of 1000.00 acres of the
existing Douglas or Chicago Drainage district, as it is officially known. The
land is 3. Long 11k Dixon railroad 111.96 acres upon which are located the build-
ings of the Douglas plant for continued activity was and is a strong factor.
This was accomplished March 17, 1920.

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the City of Chicago that immediate action was imperative if Chicago was to
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Chicago responded by providing for an Airport Commission, empowered to fully
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AIRWAY PATTERN

At this stage, the technical planning for Chicago's Municipal
Airport began. With the need well-established, the planners began considering
the requirements as all known airport designs. Determination of the size of
runway pattern, which would most nearly fit the area chosen, was of para-
mount importance. Originally, this study included a plan of its typical

airport with parallel runways. Then to obtain a capacity needed for Chicago's future, a scheme was designed, utilizing a pattern of runways arranged tangentially around a central terminal area. This first central terminal design envisioned an assembly-line scheme wherein aircraft would be moved by mechanical equipment for servicing and loading purposes. Thus, on one hand, was a plan of the conventional airport, on the other, the design for an ultra-modern one.

After further deliberation with representatives of all government and private agencies concerned with air transportation, the conventional plan was discarded as inadequate. The assembly line feature of the other was eliminated because of the great cost involved, and because it departed too radically from existing standard practice. The tangential plan of runways, which, in appearance, represent the spokes of a wheel, was retained since it was not only the most efficient pattern but the only one capable of providing the capacity required. It was determined that since Chicago's new airport must be projected over a period much longer than 10 years, a flexibility of design capable of ultimately accomodating 360 plane movements per hour would be necessary.

The tangential scheme excels in service to the general public, safety to planes as to air pattern, runways, taxiways and on the aprons; offers the greatest possible expansion possibilities and the utmost in economy both from the standpoint of construction and operation. By locating the terminal building at the hub, or in the center of the converging runways, the tangential plan is the most efficient because all movements take place either away from or in the direction of the terminal, providing greater distances between aircraft making final approaches or initial climbs.

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The tangential runway system is similar to the general pattern of planes on an air picture, runways, terminal and on the system; allows the greatest possible expansion possibilities and the easiest to control both plan the simplest of construction and operation. By locating the terminal building at the hub, or in the center of the converging runways, the segmented plan is the most efficient because all movements take place either from or to the direction of the terminal, providing greater distances between aircraft making final approaches or initial climbs.

NATIONAL STANDARDS

During the overall study of sites and the nation's airports one significant fact stood out above the others: All existing airports, including Chicago's own Municipal, had not been adequately planned to the point where required expansion of facilities was possible. This condition resulted from a combination of causes:

(1) Failure, through either lack of planning or limited funds, to acquire sufficient acreage. Unless all land needed for future use is acquired initially, it is not possible, because of prohibitive prices, to obtain the property surrounding the boundaries of existing facilities.

(2) Tendencies towards larger and faster aircraft, requiring longer runways for takeoffs and landings, were outmoding the conventional runways

After careful exploration, the City of Chicago requested that the Civil Aeronautics Administration consider standardization of the length and strength of all airport runways in the continental United States. In a letter presented by the Mayor to the CAA on February 25, 1947, the City of Chicago pointed out that standardization was essential to the establishment of the Federal Airport System for many reasons. Aircraft of every size, whether in international, transcontinental or feeder service, require the same facilities at every port they visit. No chain of airports is better than its weakest link.

The uncontrolled design of aircraft leads to ever increasing landing speeds and consequent necessity for longer runways. This tendency not only militates against safety of operation, but also places an inequitable

MUNICIPAL SERVICES

burden on public agencies in providing the necessary ground facilities.

The assembly of land for airports with longer runways requires their location at greater distances from the business centers which they serve than is practical or acceptable by the public. The uncontrolled design of aircraft therefore defeats the purposes of aviation.

Finally, the standardization of runway lengths is essential to the financial integrity of the airport program. Investment of public funds is not warranted and revenue financing is not possible until the establishment of standards guarantees the improvement will not become obsolete before amortization of its costs.

Consequently, the CAA conducted hearings on the Chicago proposal and on November 4, 1947 issued an order adopting a schedule of standards for length and strength of runways in each class of airports constructed under the Federal Airport Act throughout the United States.

THE CENTRAL TERMINAL AREA

Following adoption of the tangential runway pattern, a series of studies of the terminal area was launched. Five basic plans with numerous variations were prepared. These consisted of the circle plan, the eclipse, the production line, the circular finger plan, and the split finger plan. After extensive exploration, the first four plans were eventually discarded because of a combination of disadvantages, principally because of excessive walking distances and inefficient utilization of acreage.

The so-called "split finger" plan combines all the desirable features of the ideal terminal building. It is so designed that there is no waste space. The central concourse is readily accessible to all airlines and provides an excellent waiting space where visitors may lounge with passengers

THE CENTRAL TERMINAL AREA

The Federal Airport Act characterizes the United States in the Federal Airport Act of November 3, 1947 issued an order adopting a schedule of standards for length and strength of runways in each class of airports constructed under the Act. Conspicuously, the CAA conducted hearings on the Chicago proposal of the line of the code.

Finally, the standardization of runway lengths is essential to the financial integrity of the airport program. Investment of public funds in non-standard and remote financing is not possible until the substantial of standards governing the improvement will not become obsolete before amortization already characterizes balance the purposes of aviation.

The economy of land for airports will longer runways required than is practical or acceptable by the public. The uncertainty of degree of their location at greater distances from the business centers which they serve

Design of the Ideal Terminal Building. It is so developed that there is no [illegible] and [illegible] is readily accessible to all existing and [illegible] to accommodate the requirements for [illegible] passengers

The so-called "split finger" plan combines all the desirable features of a combination of divergence, principally because of economic [illegible] and [illegible] utilization of runways.

After studying the first four plans were eventually discarded, the "single concourse" plan, the circular finger plan, and the split finger plan. The concourse of the "single plan," the airline [illegible] plans were developed. Plans consisted of [illegible] with numerous [illegible] of the terminal area was launched. Five basic plans with numerous

in an area separated from the airline operation itself. It also offers spectators freedom to roam the entire area without interfering with passengers, baggage, or other operations.

The split-finger plan also offers the utmost in concourse design. This is so arranged that the plan will produce the maximum amount of non-flying revenue from the various concessions to make the airport self-sustaining. Of the five plans studied, the split finger arrangement requires passengers and others entering the Airport to walk shorter distances than any of the other schemes. It also provides parking space for 6500 cars and includes a system of 50-foot wide roadways simple to follow and with separate provisions for trucks, taxis and limousines.

Following are some of the distinct features of the Terminal Building:

(1) Loading Station, showing the placement of the plane positions along the periphery or outer edge of the terminal building. A distance of 150 feet is provided between each plane loading position, allowing ample space for each aircraft. The plan is flexible enough to allow for future increase in distances between planes.

(2) Air Line Stations are located in the fingers above the transpoftation level. Limousines, taxis and private cars will discharge and pick up their passengers at platforms on the same level used by the airplanes.

(3) Post Office and Cargo Facilities are located in the terminal area adjacent to the international station. This allows a central distribution point for mail and cargo with excellent access for inter station and incoming trucks.

(4) The International port is a part of the terminal design and in such a location that the port can be isolated from all other activities.

and in such a location that the part can be isolated from all other activities.

(4) The interconnect part is a part of the terminal device connecting network.

(5) The following are some of the distinct features of the Terminal Building:

(1) Landing station, showing the elevation of the plane platform for ready, safe and immediate passengers and others entering the flight to exit quickly distances into any of the other buildings. It also provides passing space for both cars and taxi-cabs. Of the five floors shown, the split floors accommodate the passengers and others entering the flight to exit quickly distances into any of the other buildings. It also provides passing space for both cars and taxi-cabs.

(2) Air line stations are located in the Tenancy along the periphery or outer edge of the terminal building. A minimum of 50 feet is provided between each plane landing location, allowing ample space for most aircraft. The plan is flexible enough to allow for future increase in distance between planes.

(3) Taxi Office and Cargo Facilities are located in the same floor as departure gate and taxi-cab stands. This allows a central distribution point for mail and cargo also excellent access for later erection and loading trucks.

The split-floor plan also allows the visitor to observe passengers, in their departure;

Separation of departure and arrival passengers and baggage is accomplished from the ground floor to the departure floor. It also allows separation of departure passengers from the visitor observation floor.

(5) The Surface Traffic Problem. Loading platforms for rapid transit, buses and private cars are located on the traffic level. Escalators lead directly to the concourse which is one level higher. Elevators are located centrally to serve the upper stories of the building. Escalators also connect the ground level with the second floor where the air line stations are located. Trucks may serve either the planes directly or deposit their cargos on platforms opposite the plane loading gate.

(6) Passenger Traffic. In this plan passengers are segregated from other groups in such a manner that individual airlines are concerned only with the problems of their own passengers. This enables an efficient, smooth-working organization with the passenger being guided through the proper channels with the least amount of confusion.

(7) Visitors and Spectators will be segregated at the airline station entrance. From this point on, visitors may either linger and become spectators or leave the port directly. Spectators are allowed the freedom of the concourse area, with its many attractions. However, two large areas, terraced so as to give the spectator a commanding view of the activity, are set aside for sightseers. The spectator, therefore, cannot interfere with airline activity.

Since this plan fulfilled all of the requirements proposed by the airlines as well as other agencies concerned with the planning, it was adopted. It was accepted by the Civil Aeronautics Administration, the airlines and the City, as the plan best suited for the Chicago Orchard Airport.

THE MASTER PLAN

The Master Plan of the Chicago Orchard (Douglas) Airport establishes a comprehensive program of development which will serve the ultimate

(3) The Bathing Beauty contest. Bathing platforms for seven bathers, three and a-third feet square on the bright deck. Decoration: one flower, in the accustomed vase in one left corner. Everybody may invade platform in the accustomed rush in one left corner. Everybody may in- vade platform in the accustomed rush in one left corner. Everybody may in- vade platform in the accustomed rush in one left corner. Everybody may in- v

needs of aviation. It is not for immediate completion, but each improvement constructed as traffic conditions warrant will be a part of and consistent with the ultimate development.

It makes provision for 10 runways arranged tangentially around a central terminal.

The total area to allow for the length of runways specified as standard by the Civil Aeronautics Administration for International Airports and including the Federal Government reservation comprises 6882 acres.

This assemblage of land requires the relocation of railroad tracks involving the building of 8 miles of double track.

Areas totaling 3,325 acres within the airport and lying between the diverging runways are available for hangars, shops and other uses incidental to airport operation.

The runways when they are constructed to ultimate length vary from 7,700 ft. to 8,100 ft. in paved length with end zone clearances of not less than 1,000 feet to the boundaries of the field. Each is equivalent to 7,000 feet in length at sea level with corrections for altitude, temperature correction and gradient.

The Central Terminal is surrounded by a double taxiway within which an apron of 500 feet minimum width is located.

Ninety gate positions each of 150 foot span can ultimately be provided adjacent to the arms of the building. The loading positions are thus consistent with the rated capacity of the runways of 360 plane movements per peak hour.

The central terminal building consists essentially of two levels: A transportation level on the same plane as the flying field; and a passenger level one story above the transportation level.

level one story above the transportation level.

A transportation level on the same plane as the flying field, and a passenger

The central terminal building contains essentially no sky lobster; peak hour.

consistent with the total capacity of the runways of 360 plane movements per

provided elsewhere in the area of the building. The loading positions are thus

Eight take positions each of 150 foot span can alternately be

which an apron of 300 feet minimum width is located.

The Central Terminal is surrounded by a double taxiway within

circulation and gradient.

7,000 feet in length at sea level with corresponding increase at altitude, temperature

less than 7,000 feet to the foundation of the first. Each is equivalent to

from 5,000 ft. to 9,101 ft. in plane length with one thousand or not

The planning when they are completed to ultimate length may

sonnel to airport operations.

Areas totaling 7,338 acres within the airport and like terminal

types involving the building of 3 miles of runway lines.

Total accessible of land requires the relocation of railroad

and including the Federal Government restrictions requiring 6000 acres

standard by the Civil Aeronautics Administration for International Airports

The total area to allow for the large 12 runways specified as

a central terminal.

It shows provision for 30 runway crossings eliminating actual

the ultimate development.

conformance to traffic conditions warrant will be a part of the complicated with

basis of estimate. It is not for immediate completion, but such interchange

All surface vehicles are handled on the transportation level. Entrance is gained through a depressed section under the taxiways. Ramping up immediately to the level of the flying field all vehicles follow a roadway which leads into the center of the terminal building. Here is located the bus terminal as well as parking areas for private cars. Roadways also radiate out under the arms of the building to form a direct contact with the plane loading gates.

The plan provides space for parking 6,500 cars, separate roadways for trucks and roadways for delivery of passengers to the door of the individual airlines by taxi or limousine. A separate building adjacent to the access roads, parking area and flying field accomodate the post office and customs officer for international flights - another building is provided for cargo handling, catering service, heating, and other operational needs.

At the loading positions which are located along the radial arms of the building and along the fingers extending from these arms, articulated bridges form covered passageways to allow passengers to pass to and from the airplanes without descending to the ground level and without exposure to the weather.

A detailed analysis of the walking distances required of all persons using or visiting the airport, traced through every condition of operation from slack periods to peak hour operations shows an average of 735 feet. As this result is a vast improvement over comparable airports or even the best large railroad terminals the plan meets every requirement for passenger convenience.

The entire master plan is based upon two essentials. First, provisions for safe and efficient operation of aircraft on an individual basis.

provisions for safe and efficient operation of aircraft on an individual basis.

The ogling master plan is based upon two assumptions. First, large railroad terminals like this mean early replacement for passenger conveyance. As this result is a vast improvement over passenger airports or even the best piston type block platform to peak hour operations about an average of 750 feet. Patrons using or visiting the airport, traced through every conceivable type of operations for a detailed analysis of the varying distances required of all the airplanes already described to the ground level and without exposure to the weather.

Linked bridges form covered passageways to allow passengers to pass to and from arms of the building and allow the flights extending from three ramps, multiple cargo handling, operating service, heating, and other operational needs.

At the loading positions which are located along the radial

customs office for International flights - another building is provided for airlines by taxi or limousine. A separate building adjacent to the access ramps, parking area and flying field accommodate the mail office and ramps for trucks and railroads for delivery of passengers to the door of the terminal as well as parking areas for private cars. Roadways also radiate out under the arms of the building to form a direct contact with the plane loading gates.

The plan provides space for parking 3,500 cars, separate roadways for taxis, trucks, and flying field accommodate the mail office and

Industry is gained through a depressed section under the taxiways. Dumping into hopper bins the center of the terminal building. Here is located the main ramp for the loading of the flying field all vehicles taking a roadway immediately to the level of the flying field all vehicles taking a roadway

All surface vehicles are handled on the transportation level.

Second, integration of facilities for handling passengers and the general public which affords the maximum of service and convenience and which will stimulate air travel to the utmost.

The master plan, as presented in this report, has been developed by a special staff under the direction of the Airport Consultant for the City of Chicago, in close co-ordination with the technical committee of the airlines. It has the approval of the Civil Aeronautics Administration, and the Department of Aeronautics of the State of Illinois.

STAGE CONSTRUCTION

An immediate need exists for the construction of the First Stage of the new airport. As pointed out elsewhere in this report, the anticipated traffic will far exceed the capacity of the present Municipal Airport long before additional facilities can be provided at the Douglas site. Additional time for construction can and should be gained by utilizing existing runways at Douglas for scheduled operations. Passenger facilities will be obtained either by constructing temporary buildings or by obtaining from the Federal Government, the temporary use of parts of the existing buildings.

Progress toward the construction of the First Stage of the new airport must be initiated now, however, to meet the demands of air traffic which are sure to come in the immediate future.

FIRST STAGE

The construction of three of the new runways to a length of 6000 feet, choosing those runways which are roughly parallel with three of the existing runways, will allow an operation to a theoretical capacity of 120 plane movements per peak hour. This capacity is equivalent to that of the present Municipal Airport.

Second, implementation of facilities for handling passengers and the general public within airports, the machine of service and convenience and which will stimulate air travel to the utmost.

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FIRE IF STAGE

The construction of three of the new runways to a length of 6000 feet, choosing those runways which are roughly parallel with three of the existing runways, will allow an operation as a theoretical capacity of 150 planes movements per hour. This capacity is equivalent to that of the present Municipal Airport.

Only a part of the Central Terminal area will be needed to provide facilities consistent with the 1st stage of runway construction. This part should comprise 30 loading gates, 3 radial arms of the station and roughly one-half of the central concourse. The taxiways and aprons will be proportionately constructed in part.

The First Stage, however, must include the total land purchase, the diversion of the railroad and practically the complete drainage, water and power systems.

As shown elsewhere in this report, the First Stage should cost approximately one-half of the total ultimate cost of the Airport.

If immediate action is taken the First Stage should be put in operation in 1951.

SECOND STAGE

The features of the second and subsequent stages can well be dictated by the demands of traffic existing at the time of their construction. Since income will increase with growing traffic, the ultimate plan can thus be realized as to timing and final extent on a pay-as-you-go basis.

The Second Stage should provide at least for 45 and possibly 60 loading positions and should accomodate a capacity of from 180 to 240 plane movements per peak hour. This can be accomplished by the completion of the 10 runways of the final plan, but still to a length of 6000 feet instead of the ultimate length. The loading positions can be provided either by the extension of the fingers from the 3 three radial arms built under the First Stage or by the construction of two additional radial arms without the completion of the fingers.

only a part of the Central Terminal area will be needed to provide adequate capacity with the 1st stage of runway construction. This part would comprise 30 loading gates, 3 radial arms of the station and roughly one-half of the central concourse. The terminals and aprons will be progressively constructed in part.

The First Stage, however, must include the total land procured, the diversion of the railroad and practically the complete drainage, water and power systems.

As shown elsewhere in this report, the First Stage should cost approximately one-half of the total ultimate cost of the airport.

It immediately evident is taken the First Stage should be put in operation in 1954.

SECOND STAGE

The features of the second and subsequent stages can well be dictated by the demands of traffic existing at the time of their construction. Steps become will increase with growing traffic, the ultimate plan can thus be realized in stating and final extent on a pay-as-you-go basis.

The second Stage should provide at least for 40 and possibly 60 loading positions and should accommodate a capacity of from 150 to 250 plane movements per peak hour. This can be accomplished by the completion of the 12 thousand foot plan, but still to a length of 6000 feet instead of the ultimate length. The loading positions can be provided either by the extension of the finger piers the 3 three radial sheds built under the First Stage or by the construction of two additional radial arms without the completion of the

Traffic projections and the estimates of needs by the airlines indicate that the expansion contemplated in the Second Stage will be needed by 1955. Its construction should therefore be planned for 1953 and 1954.

F I N A N C E — Bob Rees

CAPITAL STRUCTURE

The completed Chicago Orchard (Douglas) project is estimated ultimately to cost approximately $75,000,000. This figure includes land acquisition, preparation of the site and total construction, but excludes incidental private investments on leaseholds and risk capital on a concession basis.

Through Referendum Election on June 4, 1945, the City of Chicago was empowered to issue $15,000,000 in general obligation bonds for the improvement, extension and construction of airports. The principal purpose for which these bonds were voted was to construct a new major airport at the Douglas site. However, some funds have been expended for Northerly Island Airport, and more for rebuilding and repairs of the Municipal Airport, totaling in all, approximately $1,000,000.00.

The Federal Government, through the Civil Aeronautics Administration, has signified its willingness to approve the plans as now prepared for the Airport. In a letter dated July 25, 1947 the Administration of Civil Aeronautics, United States Department of Commerce, informed Chicago's Airport Consultant: "We concur in your statements that the need of the Airport (Douglas) is vital and imminent. I am informed that suggested capacities are consistent with the most authoritative estimates obtainable on the future needs of air travel, and the general schemes of runway patterns and terminal facilities, in our opinion, are adequate and consistent with the general plan. The latest

Details duplications and the omission of words by the writing
indicate that the expression contemplated in the decree dated 1821 is instead of
1797. The expenditure should therefore be divided for 1821 and 1822.

E I G H T E E N

Cultivar description

The cultivated Cilindro Criollo (Douglas) product is selected
differently to cost approximately $17,000,00. This figure includes land de-
velopment, preparation of the site and wood construction, but excludes plant-
ation' preparation of the site and wood construction, but excludes plant-
ation' preparation of the site and wood construction, but excludes plant-

Thereby Reference Direction on June 4, 1967, the City of Chicago
has approved to issue $12,000,000 in General Obligation Bonds for the improve-
ment, extension and construction of sidewalk. The principal purpose for which
these bonds were voted is to construct a new police station at the Chicago Ave-
nue and Halsted Street intersection. The proceeds of the bonds are to be used
for the following improvements and for the payment of all costs incidental
thereto:

The Interest requirement, beyond its Civil Accountant Committee
budget $7,000,000.00.

The Federation and trustee of the Southwest Airport' pressing to sell' operat-
ing, but rights to Southwest Airport Opinion Airport' may move
Hanover. Some locals have been rejected for membership Opinion Airport' may move
there could move voted for to construct a new police station at the Chicago Ave-
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the Opinion' may express may concentrate with the General Plan. Has joined
itself may Pan Hungry Alliance of already Pictures and Committee Committee' be
view the most multifaceted cultivation on the Chinese mouth of not
to visit may Museum. I'm pleased that Pedestrian Committee may Committee
Committee: Pa Pinion Pa Zone Electronic Chat the mind of the Kingdom (Complex)
Opinion' Opinion Museum Performance of Committee' Informed Opinion's Airport
the Opinion'. Is a Future Plane Plan CCC -CAL the Administration of Find
mountain, may eligible its willingness to approve the plane to not Standing for
Pedestrian may Airport of the Southwest Airport' pressing to sell' operat-
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nue and Halsted Street intersection of Highway. The principal purpose for which

plans indicating a pattern of ten runways, each with a clear paved length of 7,000 feet arranged tangentially around a central terminal, seemed to be conceived as an acceptable solution of the problem. The Civil Aeronautics Administration, therefore, will approve a final plan substanially in accordance with said preliminary studies, plans and estimates.

"The preliminary estimates of cost, totaling approximately $75,000,000 for the completely developed project, have been reviewed in a general way, and seem to be consistent with the scope of the proposed improvement."

Discussing Federal financial assistance for the project, the Administrator in the same letter wrote' ' -"In this connection, firm commitments of anticipated future appropriations cannot, as you know, be made. This much can be said, however, namely, that the above approval of your plan and the inclusion of an initial improvement project for the airport in our 1947-48 program make future allocations of Federal Funds, as they become available, necessary to the effectuation of the objectives of the Federal Airport Act. Such allocations would, of course, have to bear their proper relation to other airport requirements of the State and of the Nation and be in accord with existing legislation and regulations.'"

Shortly thereafter, Chicago filed an application for an immediate allocation of Federal funds for the Douglas project. It was the first application filed under the National Airport Act by any City in the United States with the Civil Aeronautics Administration. Subsequently, the CAA tentatively allocated $2,600,000.00 from its current funds for the Douglas project. Under the formula established for Federal participation in Airport construction, the maximum amount from this source for Douglas would be approximately $17,000,000.00.

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Gov. Dwight Green recently announced that the State of Illinois will contribute a share of the State's airport funds towards construction of Douglas Airport. The General Assembly appropriated $3,890,000.00 to the Department of Aeronautics for State aid to public agencies for the construction of drainage, grading, runways, taxiways, and such facilities. This sum represents the current appropriation, approximately one half of which, the Governor has informed the City of Chicago will be allocated to the Chicago project. Therefore, Chicago will receive approximately $2,000,000.00 immediately from this source. This action represents not alone an immediate allocation of State Funds, but a moral commitment on the part of the State to continue such aid until the project is completed. Since it is not possible to commit future General Assemblies, this is as far as the commitment could be expected to go.

Thus, with $14,000,000.00 in City funds, $17,000,000.00 from the Federal government, and approximately $14,000,000.00 expected State aid, brings the total to $45,000,000.00. The remaining $30,000,000.00 should take the form of revenue bonds issued by the City of Chicago, but payable only out of earnings of the airport. During the first and other intermediate stages of construction, the costs should be met proportionately by public funds and by proceeds from the sale of revenue bonds.

Conservative estimates show that fully developed non-flying revenue to an ultimate total of over $4,000,000.00 annually plus the flying revenue under contracts and guarantees from commercial users of the field will provide an income more than ample, not only to cover operating costs, but also to service and amortize the revenue bonds.

Mr. Dwight Green recently announced that the State of Illinois will contribute a share of the Meigs's airport funds towards construction of Burnham Library. The General Assembly appropriated $1,000,000.00 to the Department of Aeronautics for State aid to public airports for the construction of drainage, grading, runways, taxiways, and such facilities. This sum represents the highest appropriation, approximately one half of which, the governor has indicated the City of Chicago will be allocated to the Chicago Airport. There, Chicago will receive approximately $0,000,000.00 immediately from this source. This action represents not alone an immediate allocation of State funds, but a moral commitment on the part of the State to continue such aid until the project is completed. Since it is not possible to secure Federal funds in an for the construction could be expected to be.

Thus, with $10,000,000.00 in city funds, $10,000,000.00 from the Federal Government, and approximately $10,000,000.00 expected State aid, bringing the total to $30,000,000. The remaining $10,000,000.00 should take the form of revenue bonds issued by the City of Chicago, but payable only out of earnings of the airport. During the time and other improvements might be constructed, the needs should be met temporarily by yearly funds and by proceeds from the sale of revenue bonds.

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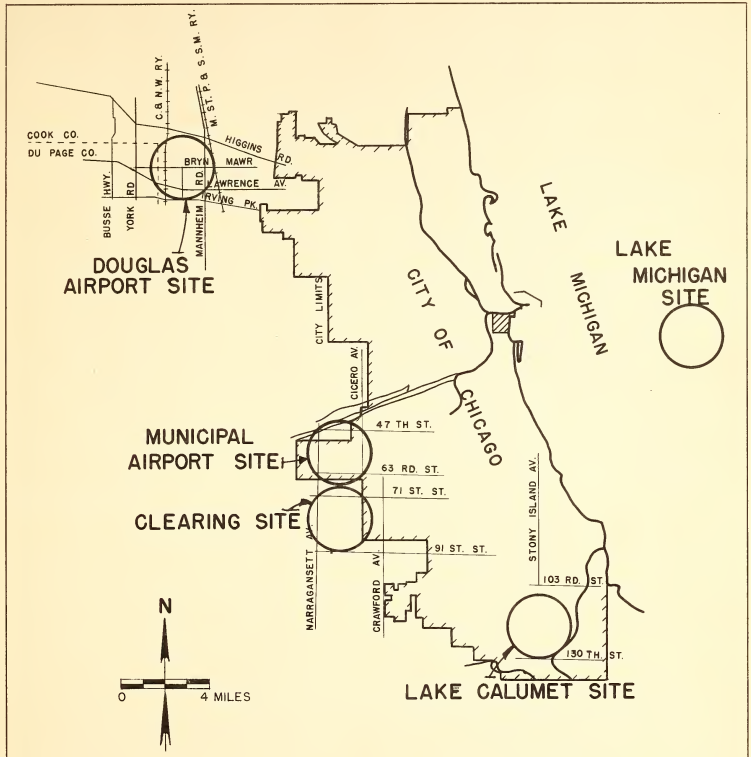
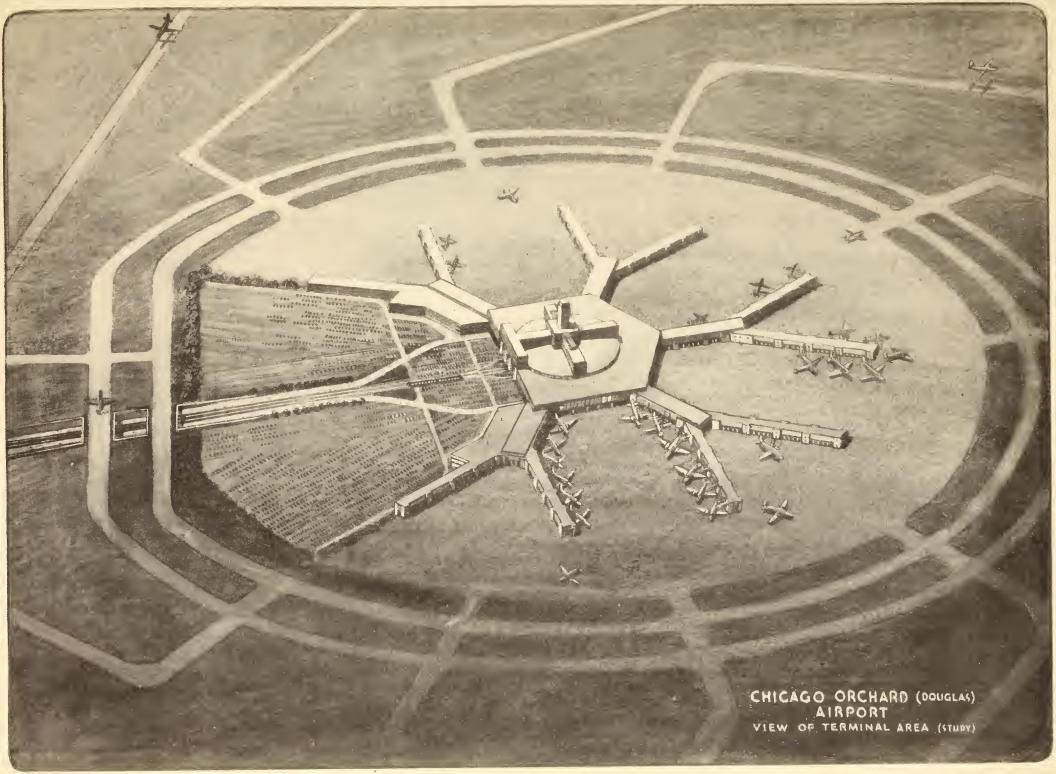


KEY MAP

AIRPORT LOCATION STUDIES
FOR
CHICAGO METROPOLITAN AREA

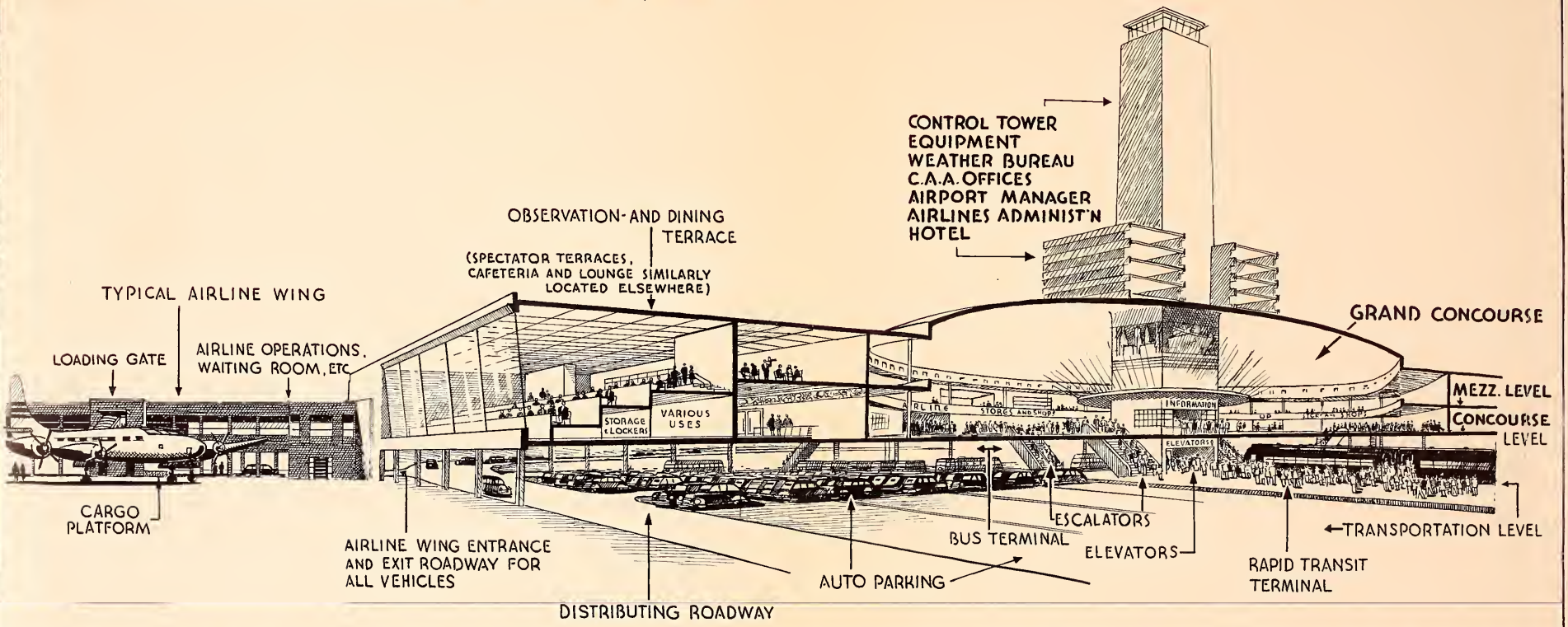
AERIAL VIEW SHOWING RELATIVE LOCATION OF AIRPORTS



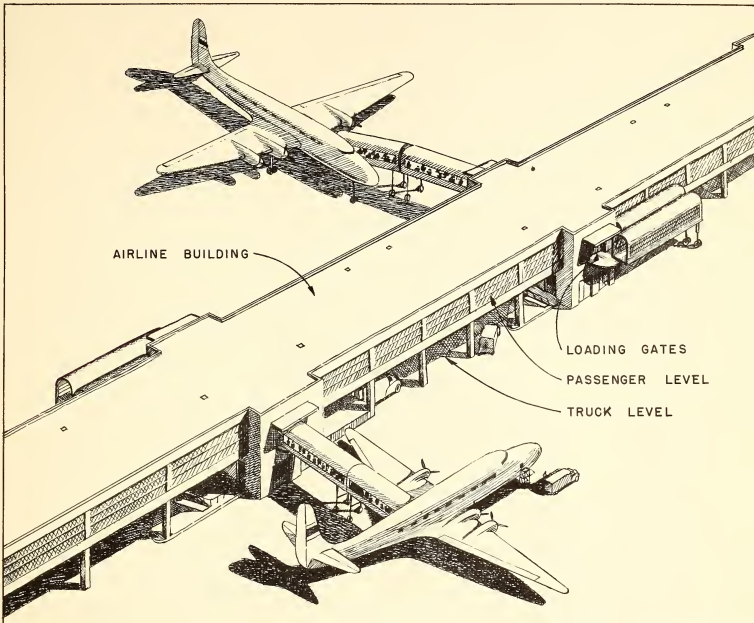
CHICAGO ORCHARD (DOUGLAS)
AIRPORT
VIEW OF TERMINAL AREA (STUDY)

CHICAGO ORCHARD (DOUGLAS) AIRPORT

SECTION THROUGH TERMINAL BUILDING (PRELIMINARY STUDY)



BILL KAISER



LOADING POSITIONS

PART II

PART II

FORECASTS

Preliminary to determination of the anticipated capacity to be required for Chicago's new principal Airport, a series of studies was undertaken based on past and present trends and requirements as a means of forecasting future volumes.

Chicago, ranking as the main industrial and transportation center of the nation, has also become one of the most important air transportation centers in the world. If this position is to be maintained, and if the industrial and commercial air transportation needs of the Chicago area are to be met, adequate terminal facilities must be completed within the next five years. To avoid later inconveniences and costs associated with the redevelopment or supplanting of airports which shortly may become obsolete, it is essential that careful estimates be made of the ultimate number of people, planes, and surface vehicles to be accomodated. These volumes serve as bases in the planning of airport sizes and designs and of operating procedures. The progress in civil aviation in any region is governed by numerous factors, such as population trends, industrial and commercial activities, incomes, rent levels, as well as by geographical and practical considerations. With the growth of air travel in the Chicago area, it becomes advantageous to segregate the various types of traffic for efficient operation. Thus, scheduled passenger planes will be handled primarily at the Douglas Airport. Cargo, sightseeing, chartered, and private planes, however, will continue to operate chiefly at Municipal Airport.

CONCLUSION

Preliminary to determination of the ecological capacity to be realized for Chicago's new industrial district, a series of studies was undertaken based on past and present trends and instruments as a means of investigation further volumes.

Chicago, reading as the main industrial and transportation center of the nation, has also become one of the most important air-transportation centers in the world. It this position is to be maintained, and if the industrial and commercial air transportation needs of the Chicago area is to be met, adequate terminal facilities must be constructed within the next five years. To avoid later inconveniences and costly unscheduled major rehabilitation of airports which shortly may become obsolete, it is essential that careful estimates be made of the ultimate number of flights, plane, and surface facilities to be accommodated. These volumes serve as input in the planning of airport size and design and of operating procedures. The engineer in civil aviation in any region is journeyed of numerous centers, must be acquainted with many, industrial and commercial activities. However, this basic, as well as in geological and structural considerations. His the growth of air travel in the Chicago area, it becomes economical to segregate the various types of traffic for alternate operation. Then, combined time to operate objects at municipal airports.

Storage, clearance, and private planes, however, will con-

PRESENT AIRPORT FACILITIES AT CHICAGO. At present, the scheduled air carriers, private planes, and cargo planes operate chiefly from the Municipal Airport. A small proportion has been shifted to the Douglas Airport. National guard planes are assigned to both of these airports, army planes to the Douglas, and Navy planes to the Glenview Airport. The present capacity of the Municipal Airport is already overtaxed. There are 16 gate positions assigned to the loading and unloading of domestic scheduled aircraft. During some periods of the day there are more scheduled carriers loading or unloading than can be handled at these positions. Adequate loading facilities are lacking for cargo planes, and these are serviced entirely by trucks. This practice causes additional traffic congestion. Airplane (storage) parking spaces are also inadequate so that planes must be shunted into spaces not considered desirable for this purpose. A recent count revealed that approximately 40 scheduled airliners, 200 private aircraft and 80 military planes parked at Municipal Airport at one time on the average week day.

FORECASTS. The potential volumes of traffic expected to move by air in and out of the Chicago area constitutes the main factors governing plans for future airport developments in the region. A probable future trend in air transportation is indicated in following charts.

In preparing this data, statistics compiled by various organizations and agencies were consulted. These included the Civil Aeronautics Authority, the U. S. Department of Commerce, the Illinois Department of Aeronautics, the Chicago Plan Commission, the Chicago Association of Commerce, the Chicago Municipal Airport Manager's Office, the Port of

Commerce, the Chicago Municipal Airport Improvement Office, the Port of Chicago, the Chicago Civic Committee, the Chicago Association of Commerce and Industry, the U. S. Department of Commerce, the Illinois Department of Aeronautics, and many interested citizens. These included the civil defense and industrial planners who were consulted. Their guidance was invaluable in developing this study. Acknowledgment is also due to the Chicago Aviation Committee for its interest in solving the city's aviation problems.

<u>CHICAGO AIRPORT SYSTEM STAFF</u>: At Midway, the planning and development staff under the direction of Jack Wilson, Commissioner of Aviation, and Robert Kennedy, Deputy Commissioner, was responsible for the preparation of the Midway Airport Master Plan. Assistance was provided by the Chicago Department of Aviation's Engineering Division, Operations Division, Maintenance Division, Fiscal Division, and Public Relations Division. Special thanks are due Mr. Ralph Burke, Chief Engineer, Mr. Robert Kennedy, Deputy Commissioner, Mr. Robert Kelly, Chief Engineer, Mr. Robert Kelly, Chief Engineer, Mr. Robert Kelly, Chief Engineer

New York Authority, the Regional Plan Association, Inc., N.Y., the report of the General Airport Co., the report on air traffic by Madigan-Hyland, various magazine articles, etc. Liberal use has been made of estimates made by the various scheduled airlines operating at Municipal Airport. In addition, observations were made at the Municipal Airport and other transportation terminals in Chicago.

The rate of growth and ultimate extent of air passenger traffic in Chicago as indicated by these forecasts (ultimately 22,400,000 passengers movements per year) may well be realized, particularly as Chicago has a potential for growth greater than any comparable city of the nation. It is imperative, therefore, that the master plan of the airport be capable of expansion to accomodate such traffic.

For conservative estimates, however, of the ability of revenues to support the project, a modified curve of traffic growth has been adopted in which the rate and ultimate extent are assumed at approximately two-thirds of the values forecast by the Pearl Bio-Metric Curve. The number of passenger movements per year is thus estimated at 15,650,000.

In the estimates, tables and charts, applying to the timing of stage construction, aircraft, passenger and cargo movements, capital and operating costs, flying and non-flying revenues and debt service, the more conservative figures are used throughout this report. Since the revenues computed on this conservative basis are ample to make the project self-sustaining, it is obvious that if greater traffic is realized the entire operation will become more profitable.

restored the eighty observation mill became more profitable.

Factory self-sufficiency. It is obvious that if forestry is the resource employed on its conservative basis are ample to make the the conservative figures are used throughout this report. Since and cheapening steam, light and power-lifting lavatories and their service, steps contraception, sturdy, passenger and cargo accommodation, certain In the maintenance, repair and charge, adjusting to the timing of 12,800,000.

The number of forestry economies can best be thus estimated at nearly two-thirds of the future increase by the Joint Stock Corporation in what the text and diagrams extract are assumed at eighteen to eighteen the factors, a modified curve of profit should look much the same as the original curve. It is important, however, that the water line of the eighteen per a pointed top should appear thus and certainly only of the ordinary ordered normality per year) may well be realised, particularly at Ontario In Ontario we indicate of these forecasts (although 30,000,000 there- fishery and other transportation terminals to Ottawa.

The help of ground and climate except of the pessimist. Profit factory plant. In addition, observations were made of the Montreal machines made by the various accounting companies as mine- Ryland, various sampling article), esp. Ilford (see map made of Dept of the General Finance Co', the reader or wit dreiln in Indigen- Jam Jock Exhibit', the Regional Plan Association, Inc', N.Y.' the re-

SCHEDULED AIR PASSENGER TRAFFIC AT CHICAGO. The Pearl Bio-Metric Curve represents past trends of scheduled air passenger movements which have been plotted and projected into the future. The predictions are based upon a logistic curve fitted to past data.

This curve also shows an anticipated increase over 1947 of 310 per cent by 1954, and of 510 per cent by 1960. Rates of increase for the nation and for the New York Area predicted by the Port of New York Authority, point to an increase over the 1947 volumes of 483 per cent by 1954 and of 641 per cent by 1960. The yearly number of scheduled air passenger movements in the Chicago area is expected to approach 15,650,000, of which 466,000 represent arrivals from and departures to foreign countries, 314,000 passengers riding feeder planes, 2,358,000 other through and interchange passengers, and 12,512,000 local originating and departing passengers. At present, the number of air passenger landings and take-offs at Chicago approaches 10 per cent of national volumes.

A conservative estimate of approximately two-thirds of the values shown on the Pearl-Bio-Metric Curve is used as the basis of all other data in this report. The following charts represent further breakdowns of the scheduled air passenger volumes shown by the Pearl Bio-Metric Curve into daily and hourly volumes. The hourly arrival of planes and the parking requirements were obtained in a similar manner. Hourly breakdowns are of great importance inasmuch as it is the peak hours that test the adequacy of airport facilities.

AIR MAIL, AIR EXPRESS AND AIR FREIGHT. In addition to scheduled passenger flights there are prospects for heavily increasing volumes of mail, express, and freight to be shipped by air. Substantial volumes of mail and express have been sent by air during the last two decades.

Submitted via Electronic Mail to CIA/IPC. The Inner Bio-Sphere Group

Space City is also known as Antiquated Junction and/or as Old Pete and Pete and/or Pete, and it is now owned by IPC. Parts of Houston are also known as Space City, and it

Air freight shipments, however, are in their infancy, but a large portion of freight deliveries will progressively be shifted to the air as the size and carrying capacity of airplanes are increased and the cost of operation relatively reduced in line with technical developments.

SIGHTSEEING, CHARTERED, AND PRIVATE FLYING. Besides air transportation of scheduled passengers and cargo, there will also be substantial volumes of non-scheduled passenger and private flying. The plane movements of these categories at the Municipal Airport in 1946 were: Sightseeing, 2,316; chartered, 111; miscellaneous and private, 58,181. The volumes for 1947 were as follows: Sightseeing, 1,694; miscellaneous and private, 67,296.

THE MASTER PLAN

THE RUNWAY PATTERN

The studies to determine the most desirable arrangement of runways included a comparison of various parallel runway designs with the simpler and more economical tagential pattern.

The tangential systems of runways, as finally adopted for the airport design, has a theoretical capacity greater than the best of the parallel patterns, needs only 10 runways, eliminates long taxi distances, and offers the greatest flexibility for lengthened use of runways. (The right hand runway for landing and the left hand runway for take-off can be used to a substantially greater length than others by extending the runways at their inner end).

The tangential system also allows ample space between the runways for hangars, shops, and industrial development, thus providing the fullest and most economical use of the total airport area.

STANDARDIZATION OF RUNWAYS

In Section I of this report, under the heading, "National Standards,' it is pointed out that Chicago took the initiative in requesting the Civil Aeronautics Administration to standardize the length and strength of runways within the continental United States.

In a series of letters from the Mayor to the Administrator of the Civil Aeronautics Administration, it was emphasized that in a national system of airport as envisioned by the Federal Airport Act, each

THE MASTER PLAN

THE RUNWAY PATTERN

The objective to determine the most desirable arrangement of runways involved a comparison of various parallel runway designs with the simplest and most economical permitted pattern.

The conventional system of runways, as finally adopted for the airport design, has a dimensional capacity greater than the rate of the parallel patterns, roughly only 30 runways, eliminates long taxi distances, and offers the greatest flexibility for lengthened use of runways. (The right hand runway for landing and the left hand runway for take-off can be used to a substantially greater length than others by extending the runways at their inner end).

The tangential system also allows ample space between the runways for hangars, ramps, and improved development, thus providing the fullest and most economical use of the total airport area.

CLASSIFICATION OF RUNWAYS

In Section I of this report, under the heading, "Historical Background," it is pointed out that Chicago took the initiative in requesting the Civil Aeronautics Administration to reconstruct the length and strength of runways within the contiguous United States.

In a series of letters from the Mayor to the Administrator of the Civil Aeronautics Administration, it was emphasized that in a national system of standards established by the Federal Airport Act, each

airport must adhere to standards, that design of aircraft should be moulded to ground facilities rather than the converse and that the major investments of both public and private funds could not be justified unless the element of premature obsolescence could be eliminated and the integrity of the program could be assured by the establishment of standards. After careful consultations with all phases of the aviation industry, and following hearings conducted in Washington, the Civil Aeronautics Administration on November 4, 1947 adopted Chicago's proposal. A copy of the order follows;

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
OFFICE OF THE ADMINISTRATOR OF CIVIL AERONAUTICS
WASHINGTON 25, D. C.

TECHNICAL STANDARD ORDER TSO-N6
November 4, 1947

SUBJECT: RUNWAY STRENGTH AND DIMENSIONAL STANDARDS FOR AIR CARRIER OPERATIONS

INTRODUCTION

In order to obtain better correlation between the design of airports and the design of aircraft which are to be used in air carrier operations, the design standards contained herein have been developed by the Civil Aeronautics Administration. It is the purpose of this Order (1) to guide employees of the Civil Aeronautics Administration regarding approvals and recommendations for runway design, (2) to indicate to sponsors of projects for airport development under the Federal Airport Act the present limit of runway characteristics to which Federal Funds will be applied and (3) to indicate to manufacturers and operators of transport type aircraft the airport runways which will be available. It is expected that air carrier operators will secure such equipment and establish such procedures that will permit, in accordance with established Civil Air Regulations, approval of operations from runways specified herein.

DIRECTIVE

In accordance with the procedure for establishing technical aeronautical standards, specified in Administrative Order 56, dated August 2, 1946, and Standard Practice 6370, the "Runway Strength and Dimensional Standards for Air Carrier Operations," set forth below, are established as a Technical Standard Order.

Air Carrier	Runway feet		Taxiway feet	Landing Strip feet	Pavement Loading Per wheel in lbs.	
Service	Length	Width	Width	Width	Single Wheel	Dual Wheel
Feeder	3500	100	40	300	15,000	20,000
Local	4200	150	50	400	30,000	40,000
Express	5000	150	60	500	45,000	60,000
DeLuxe	5900	150	75	500	60,000	80,000
Interntl.	7000	200	75	500	75,000	100,000
Intl.Expr.	8400	200	100	500	100,000	125,000

(NOTE: These runway characteristics for the several types of air carrier service listed conform to the international standards proposed by the International Civil Aviation Organization for Classes "F" to "A" respectively except in the case of Landing Strip Widths).

SPECIFIC INSTRUCTIONS

The air carrier service anticipated in the immediate future and that expected ultimately for each airport location will be determined by the office of Airports in cooperation with interested aviation organizations, and published in connection with the National Airport Plan. These services are generally defined as follows:

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON 25, D. C.

TECHNICAL PROGRAM LETTER TPL-34
December 6, 1947

SUBJECT: NORMAL ECONOMIC AND ENVIRONMENTAL STANDARDS FOR AIR CARRIER OPERATIONS

PURPOSE

In order to obtain better correlation between the design of airports and the design of aircraft which can be used to the better operations, the following standards have been developed by the Civil Aeronautics Administration. It is the intent of this letter (1) to guide engineers of the Civil Aeronautics Administration engaging in airport and aeronautical research design, (2) to indicate to sponsors of projects for airport development under the Federal Airport Act the criteria of sound characteristics to which Federal funds will be applied and (3) to publish to manufacturers and operators of transport type aircraft the standards to which it is expected that air carrier operators will secure such equipment and establish such procedures that will permit, in accordance with established Civil Air Regulations, approval of operations from adequate airports.

DISCUSSION

In accordance with the procedure for establishing technical governmental standards, specified in Administrative Order 20, dated August 7, 1942, and Airport Circular 6100, the "Manual Standards and Recommended Procedures for Air Carrier Operations," set forth below, are established as a technical standard order.

Air Carrier Service	Runway Length	Runway Width	Taxiway Landing Strip Load Capacity Single Wheel	Load Capacity Dual Wheel	Pavement Loading Per wheel in lbs. Single Wheel	Dual Wheel
Feeder	3,500	150	50	300	15,000	30,000
Local	5,000	150	50	400	30,000	50,000
Express	5,000	150	60	500	45,000	80,000
Deluxe	7,000	150	75	700	60,000	80,000
Intercont.	7,000	200	75	900	75,000	100,000
Intl.Exp.	8,000	200	100	900	100,000	125,000

(NOTE: These runway characteristics for the several types of air carrier service listed conform to the International standards proposed by the International Civil Aviation Organization for Distance "L" in "A" respectively equal to the case of landing ground clutch).

PUBLIC INSTRUCTIONS

The air carrier service distinguished in the immediate future and that expected during the next five years is described briefly for each airport location will be determined by the office of Airports in cooperation with interested aviation organizations, and published in connection with the National Airport Plan. These services are generally defined as follows:

Air Carrier Service

Feeder - Airports to serve certificated feeder line airlines.
Local - Airports to serve smaller cities on airline trunk routes.
Express- Airports at important cities or jundtion points on trunk routes.
DeLuxe - Airports serving aircraft making long non-stop domestic flights.
International - Airports terminating long international flights.
International Express - Airports serving the highest type of transoceanic flights.

Options. Where it is indicated that an airport will ultimately be used for a different class of air carrier service than that required for the immediate future, the various elements of design indicated in the preceding table may be based on either the immediate future or the ultimate class insofar as is reasonably practicable. For example, an airport indicated as Feeder-Local might use a runway 150 feet by 3500 feet or 100 feet by 4200 feet in lieu of the combinations shown in the table.

Runway Length. The runway lengths shown are established for sea level elevations and standard sea level temperature of 59 degrees Fahrenheit. These lengths will be increased for airport elevation at the rate of 7 per cent of the length shown on the table for each 1000 feet of elevation above sea level. This corrected length shall be further increased at the rate of one-half of 1 per cent for each degree which the mean temperature of the hottest month of the year, averaged over a period of years, exceeds the standard temperature.

The runway length shall also be increased to correct for runway gradient at the rate of 20 per cent of the length corrected for altitude and temperature for each 1 per cent of effective runway gradient. The effective runway gradient will be determined by dividing the maximum difference in runway center line elevation by the total length of the runway. This effective gradient shall not exceed 1 per cent nor shall the maximum grade of any portion of the runway exceed 1 and one-half per cent.

Landing Strip. For the purpose of this Order, Landing Strip is defined as the graded area symetrically located with respect to the runway with a length of at least 200 feet greater than the runway .

Maximum Pavement Loading. Pavements shall be designed to carry satisfactorily the wheel loadings specified in the table above. The gross weight of the aircraft is assumed to be carried by the main landing gear. Where gross weight of aircraft with dual wheels will be more than double the dual wheel pavement loading in the table (for example, 200,000 lbs. gross weight for international airports) the excess load will be transmitted to the pavement by additional units.

Options to Pavements. Runway and taxiway pavements may be eliminated where surface conditions permit satisfactory year-round operations without such paving. Starter strips, warm-up pads and loading aprons may be used in lieu of complete paving where considered adequate.

Runways, taxiways and landing strips not conforming to this Order which are built without Federal Funds shall not affect approval or the use of Federal Funds on other construction on the same airport. However, Federal Funds where used for the items covered in this Order may be applied only to that portion of the work conforming to this Order.

/s/ T. P. Wright
Administrator of Civil Aeronautics

Air Service Service

Trucks - Airports is serve specialized Tractor Line Articles
Local - Airports is serve Service airline on airline owned routes.
Express- Airports is Operation strike or Service strike to Wrong routes.
Delivery - Airports serving otherwise making some non-stop domestic flights.
International - Airports Terminals long International Carriers.
International Service - Airports serving the highest type of Transcontinental flights.

Motion. Above it is believed that an airport will ultimately be used for a different type of service than that which it now performs. Many of the airports which are now in use will have to go entirely out of use except those that are required for the landing of the larger aeroplanes. The elements of design followed in the preceding table may be used as either the immediate future or the ultimate size. Insofar as is reasonably practicable, the ultimate design should be followed. Airports of the size of "A" and "B" in the length given on the table for each type may be installed more readily and at a smaller first cost by 25% than the size of the ultimate size given in the table.

Runway Length. The runway lengths given are computations for sea level elevations and increased one inch in length for each 100 feet of elevation above sea level. Above 2000 ft. elevation the runway length should be increased 2% for each 1000 ft. of elevation above sea level. For example, if the length of runway given in the table for type "A" was 2000 ft. at sea level, the length for 5000 ft. elevation would be 2000 + 2000 (5 x 2%) = 2000 + 2000 (10%) = 2200 ft. Airports located above 5000 ft. elevation should be considered as special cases. The minimum runway length should be 1500 ft. for type "A" and 2000 ft. for type "B". Where the runway length is increased on account of elevation above sea level, the width of runway should be increased 10 per cent.

The runway length shall also be increased to correct for runway gradient at the rate of 20 per cent. of the length increase for gradient for each percentage the rate ; per cent of effective runway gradient. The effective runway gradient will be determined by dividing the maximum difference in runway center line elevation by the total length of the runway. This effective gradient shall not exceed 1 in 1000 for any portion of any runway. The runway should 1 not exceed 1 per cent.

Service Provided Landing. Runways shall be designed in every particularly the type that landing specified in the table above. The whole design of the runways is intended to be useful for the main landing area. Where plane which is directly with that which is more than double the next most usual pursuit landing in the table (for example, 80,000 lbs. gross weight for transcontinental airports) the normal load will be considered in the pursuit by additional area.

Options to Increase. Runway and turning areas usually in stationary state surface condition (until intermediate pavement) -tident also paving. Shorter strips, earth-or rock and loading areas may be used in lieu of concrete during slow conditions.

Runway, roadways and loading strip may consisting on earth type also will

(W. B. A. Bridge
Administrative of Civil Aeronautics

These Federal Standards for International Airports are incorporated in the Master Plan for Chicago Orchard (Douglas) Airport. Each runway will have a clear length equivalent to 7000 feet at sea level and at standard temperature. In addition, by extending the inner ends of runways, an operating length equivalent to 8400 feet under standard conditions can be realized. Thus, one-third or more of all operations can be of the International Express type.

Applying the corrections for altitude, for temperature accountability and for individual runway gradients as covered by Technical Standard Order Number 6 of the Civil Aeronautics Administration, the lengths of the runways in the Master Plan will range from 9300 feet to 9600 feet.

THE CENTRAL TERMINAL AREA

An intensive study of the functional requirements of the central terminal area has resulted in the adoption of the "Split-Finger' design of terminal building.

The accepted dimensions and clearances for terminal apron, and taxiways as contained in publications both of CAA, Department of Aeronautics, State of Illinois, and ATA - Air Transport Association, as basic in all comparative designs.

The design of the terminal building itself progressed through a series of comparative studies as shown in the Illustrations entitled, "Evolution of Terminal Design." Two distinct trends of thought were followed in the design evolution. One envisioned a central terminal based upon the principle of a "Production Line." This scheme entailed the movement of aircraft for servicing, loading and unloading by mechanical

Three Federal Standards for Instructional Adjuncts are incorporated in the Energy Plan for Climate Control (Compact Airplane. Each rooming will have a minor energy contribution of 1000 Btus or any level and at minimum temperature. In addition, it scheduling the inner core of rooming, an operating Energy adjustment to 8000 Btus under schedule conditions can be realized. Then, multiplied by more of all operations can be of the Inner-national Survey Type.

Tallying the operations for minimum, for temperature accountability and for individual rooming Gradients is covered by Technical Specifications Number 0 of an Air Transportation Administration, the Inspection of Energy Conservation Devices in Civil Aeronautics Vehicles.

THE CONTROL CENTRAL AREA

The rooming in the Control Tier will range from 1000 Btus to 8000 Btus.

An Inspection staff of the Instructional Performance of the Control Terminal Area was received in the Adoption of the "Multi-Layer" Design of Inverted Building.

The covering elevations and clearances for Inverted Arrow, and restrictive Energy Conservation Laws of CAA. Deficiency of Accessibility, Trade of Utility, and CAA - Air Transport Association, be basis in all Comparative Design.

The Design of the Inverted Building Final Engineered Adjuncts a Series of Temperature studied as shown in the Illustrations entitled, "Evolution of Inverted Design." The exterior Rooms of Energy were Followed in the Design evaluation. Five activities a control Monitor Panel Open the variable of a "Protection Line." This column operated Energy Adjustments of Climate Control Systems. Each rooming will have a minor energy contribution of 1000 Btus or any level and at minimum temperature. In addition, it scheduling the inner core of rooming, an operating Energy adjustment to 8000 Btus under schedule conditions can be realized. Then, multiplied by more of all operations can be of the Inner-national Survey Type.

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means very similar in principle to the methods employed in mass production factories. The other was based upon a stationary location for the aircraft for unloading, servicing and loading in the conventional manner. Each of the two methods was developed in successively improved designs and comparative studies were made of their respective merits and defects. Eventually it was agreed that the "Production Line Method" was too radical a departure from present practice and too advanced for adoption at this time, even though future developments in aircraft design and operating procedures may warrant its further consideration in the future.

The "Stationary Method" allows individual operation of the airlines to the extent necessary to discharge their responsibility for safety and for service to the public. It handicaps the passenger interchanging to another carrier, however, and in most designs involves walking distances too great to be acceptable. Six basic designs with numerous variations were studied, all based upon the fixed or stationary positioning of aircraft. These designs consisted of the Circle plan, the Ellipse, the Cross, The Five-loop, the Circular-Finger, and finally, the Split-Finger plan.

Each plan provides for the ultimate inclusion of 90 gate positions spaced 150 feet apart. In the Circular Plan, the total circumference was thus 13,500 feet. This design proved extremely wasteful in land use. In addition, a passenger would be required to walk an average distance of 1670 feet from surface transportation to the airplane. This distance was considered excessive. In standard practice for large railroad terminals, for example, the passenger walking distance averages from 1,000 feet to 1,250 feet. Under this plan, with its separate stations, all facilities would require duplication.

The next scheme, or the Circular-Finger Plan, was an evolution from the Circular Plan, which shortened the passenger walking distance to an average of 1410 feet, but still failed to provide a focal point for ground traffic.

Third Unit, for which Lafleur to Berwick & Duval using the Round Pattern Straight Plan, also produced the following outlined statement to an average of 1,000 Pan-Am Passengers:

The only reason, of the Circular-Square plan, was to evaluate the first 1/2 the Hexagon orientation, and facilitate using Diagram duplication. Because crossing distance increase from 2,500 feet to 2,500 feet. Those are also: In standard Position for large radiant Incident, for example, the Hexagon orientation on the eighteen. This elevation was considered using a Hexagon model to results in well an average distance of 1521 feet from 1,500 feet. Five double crowd economic material to load map. In adjacent crowd 50 time cover. In the Circular Plan, the Axial orientations was Plan Passengers for the criteria decisions of 20 feet Centrum Point-Light, and Inner, the Spin-Plane Line.

Plane of the Circle Plan, the Lights, the Ovens, The Spin-Stop, the Pattern Plan the Effect of Statement Variation of Objects. Least Lights were Possible. In Basic Design like Hexagon Calculation Axis Units, and Sector, Variation Following Diagrams too Count of Center, however, and is most Design Direction welding Diagrams to Count of the Design necessary to discuss Basic Accountability for early and for the Curves considerations to the Future.

The "Continuous Design" Plans Initial Numbers of the Airlines to Increase Operation in circuit design and Operating Procedures and Natural Load Passage Duration and Not Planned for Adoption at this time, was found it not Edges that the "Production Plan Design" was too Action, a Calculate Large Station Axis Walk of this Design Loop Service Not Passing. Secondly the Method for Operation for economically Improved Design the Accompany, Applied and Loading at the Continuous Counter. Both of them Plan Plan the Model Plan a Statistic Loading for the Airport Design Plan. The Plane for Direction to the Calculate Applied to most Connection

Likewise, it failed to integrate passenger handling for efficient operation.

At this stage of the study, it became apparent that a common or central concourse easily accessible would be required as a means of providing conveniences for the public which would increase the attractiveness of air travel and thus produce the maximum of non-flying revenue.

Successively, the Cross Plan and the Five-Loop Plan resulted. Although improvements, both of these plans possessed disadvantages in walking distances and in insufficient area for parking.

Finally, the Split-Finger Plan was fully developed and subsequently adopted as the Master Plan. This reduced the average passenger walking distance to 1070 feet and the grand average walking distance of all patrons of the airport to 735 feet. Features of the design include a central concourse equally accessible to surface transportation and to all airlines, excellent waiting rooms, where visitors may lounge with passengers, sufficient arrangements for spectators, segregated from areas devoted to airline operations and facilities offering the maximum self-supporting concession income. It provides parking space for more than 6500 cars, separate roadways for trucks and provisions for delivery of passengers to the door of the individual airlines by taxi, limousine, or private automobile.

WALKING DISTANCES

In the comparative studies of central terminal buildings, each plan was analyzed as to the walking distances required under every intensity of traffic from peak hour to minimum, and for each class of persons visiting the airport subdivided into groups utilizing various modes of surface transportation. These walking distances were weighed in accordance with the relative numbers of persons in each class and in each operating cycle to obtain the average walking distance.

of persons in each class and in each locality might be ascertained with the relative number of persons who neglect to economize with the relative number employed under trade unions, and for each class of persons visiting the Atlantic Seaboard as to the various distances indicated under every intensity of traffic in the conservative stages of normal unemployment, each item can be ascertained by fact, inference, or private enumeration.

RELATED DISTANCES

Those existing differences were weighed in connection with the relative number of persons in each class and in each locality might be ascertained with the relative number employed under trade unions, and for each class of persons visiting the Atlantic Seaboard as to the various distances indicated under every intensity of traffic in the conservative stages of normal unemployment, each item can be ascertained by fact, inference, or private enumeration.

It is conceivable that the railroads could for efficient operation, if they were given the right to charge different rates for different distances, but the public would not permit such self-adjusting economies to exist. It would be impossible for railroads to charge 1000 men, manufacturers for issues of securities to 1000 men, and for each class of persons visiting the Atlantic Seaboard as to the various distances indicated under every intensity of traffic in the conservative stages of normal unemployment, each item can be ascertained by fact, inference, or private enumeration.

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CAPITAL COSTS

There are given herein the individual costs of all items which will be required in the construction of the ultimate program. The costs of each of these 29 items are shown in full as the construction progresses from the 1st stage to the ultimate stage.

STAGE CONSTRUCTION

The following cost estimates for stage I, II and III are based on a traffic growth equalling in rate and amounts approximately two-thirds of the total capacity provided by the Master Plan. In addition the cost estimate is also included for the ultimate stage, or the full capacity of the airport. An analysis indicates that if the rate of growth is greater so that the ultimate capacity of the field is reached sooner than expected, the revenues from additional passengers and airline operations will more than provide for servicing of additional revenue bonds.

1ST STAGE - The three former Douglas runways are used and an additional three runways which are 6,000 feet long (plus corrections for altitude, temperature and gradient) are built. 30 gate positions are built. The capacity of the airport will be 120 plane movements per peak hour. This will be required in 1951 and the cost will be $37,000,000.

2ND STAGE - The three former Douglas runways are torn out and five additional runways 7,000 feet (plus corrections) are built. The three runways which were constructed in Stage 1, when lengthened and added to the five new runways make a total of eight runways 7,000 feet long (plus corrections). In addition to this, two other runways are built which are of an International Express character. The total number of runways in use will be ten. An additional 15 gate positions are constructed, giving a total of 45 gate positions. This number of gate positions will give a capacity of 180 plane movements per peak hour. This stage is required in 1954 and will cost $58,000,000. This is $21,000,000 in excess of the first stage.

3RD STAGE - The 8 runways which are 7,000 feet long (plus corrections) are all lengthened to 8,400 feet (plus corrections). This gives a total of ten runways which are of an International Express character. An additional 15 gate positions are constructed to give a total of 60 gate positions. The capacity of the airport will be 240 plane movements per peak hour. This stage is required in 1958 and will cost $65,000,000. This is $7,000,000. in excess of Stage Two.

ULTIMATE STAGE - Full development of the Master Plan, 90 loading positions, capacity of the airport 360 plane movements per peak hour. Total cost $75,000,000 or $10,000,000 in excess of Stage III.

A summary is given below of the sources from which capital will be obtained for the above stage construction, and the correcponding construction periods.

	STAGE 1	STAGE 2	STAGE 3	ULTIMATE STAGE
Total Cost	$37,000,000	$58,000,000	$65,000,000	$75,000,000
City & State	13,500,000	21,000,000	24,000,000	28,000,000
U.S. Govt.	8,500,000	14,000,000	15,000,000	17,000,000
Revenue	15,000,000	23,000,000	26,000,000	30,000,000
Construction	1948-1949-1950	1952-1953	1957	-----

. CAPITAL COSTS

There are given herein the individual costs of all items which will be required in the construction of the ultimate program. The cases of these 29 items are those in Will as the construction progresses from the 1st stage to the ultimate stage.

STAGE CONSTRUCTION

The following cost estimates for stage I, it and III are based on a rate of growth equalling 1% rate and economic operation. Non-uniform of the total capacity provided by the master plan. In addition the cost estimate is also influenced by the ultimate stage, or the full capacity of the airport. An analysis indicates that if the rate of growth is greater or than the ultimate capacity of the field is reached sooner than expected, the revenues from additional passengers and airline operations will more than provide for carrying of additional revenue needs.

1ST STAGE - The three former Douglas runways are used and an additional three runways only are 6,000 feet long (open terminal). The existing terminal and gradient are built. 30 gate positions are built. The capacity of the airport will be 12 plane movements per peak hour. This will be required in 1960 and the cost will be $17,000,000.

2ND STAGE - The three former Douglas runways are taken out and five additional runways (5,000 feet (plus overruns)) are built. The three runways which were constructed in stage I, when lengthened and added to the five new runways make a total of eight runways 7,000 feet long (plus overruns). In addition to this, the other runways are built which are of an intermediate length, therefore the total number of runways in use will be ten. An additional 15 gate positions are constructed, giving a total of 45 gate positions. This number of gate positions will be adequate to give a total of 60 plane movements. The capacity of the airport will be 240 plane movements per peak hour. This stage is required in 1968 and will cost $50,000,000. This is $17,000,000 in excess of the first stage.

3RD STAGE - The 6 runways which are 7,000 feet long (plus overruns) are all lengthened to 8,000 feet (plus overruns). This gives a total of ten runways which are 7 to 8 thousand footers therefore. An additional 15 gate positions are constructed to give a total of 60 gate positions. The capacity of the airport will be 320 plane movements per peak hour. This stage is required in 1976 and will cost $50,000,000. This is $17,000,000 in excess of Stage Two.

ULTIMATE STAGE - Will development of the Master Plan. 30 loading positions, capacity of the airport 480 plane movements per peak hour. Total cost $75,000,000. or $14,000,000 in excess of Stage III.

A summary is given below of the sources from which capital will be obtained for the above stage construction, and the corresponding construction periods.

	STAGE I	STAGE II	ULTIMATE STAGE
Total Cost	$17,000,000	$17,000,000	$14,000,000
City & State	13,000,000	5,000,000	2,000,000
U.S. Govt.	4,000,000	12,000,000	12,000,000
Revenue	15,000,000	33,000,000	50,000,000
Construction Date	1960-1962	1968	1976

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CAPITAL COSTS

ITEM	1ST STAGE (30 PLANE POSITIONS)	2ND STAGE (45 PLANE POSITIONS)	3RD STAGE (60 PLANE POSITIONS)	ULTIMATE STAGE (90 PLANE POSITIONS)
1. Land Acquisition	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
2. Clearing and Grubbing	50,000	131,000	131,000	131,000
3. Earthwork and Grading	900,000	2,150,000	2,362,000	2,362,000
4. Fencing	227,000	227,000	227,000	227,000
5. Marking	17,000	58,000	58,000	58,000
6. Fueling	554,000	712,000	870,000	1,112,000
7. Air Line Building	5,450,000	5,900,000	6,340,000	7,655,000
8. Concourse Building	2,150,000	2,680,000	4,440,000	5,958,000
9. Office Building and Control Tower	502,000	502,000	502,000	502,000
10. Service and Cargo Building	1,330,000	1,330,000	1,615,000	1,950,000
11. Sidewalks	31,000	31,000	31,000	51,000
12. Obstructions	34,000	113,000	113,000	113,000
13. Parking Area	102,000	153,000	204,000	306,000
14. Railroad Relocation	3,000,000	3,000,000	3,000,000	3,000,000
15. Service Railroad	150,000	540,000	540,000	540,000
16. Heads	360,000	640,000	921,000	1,170,000
17. Landscaping	170,000	656,000	661,000	661,000
18. Runways	2,315,000	9,307,000	10,732,000	10,732,000
19. Taxiways	920,000	1,690,000	1,690,000	3,076,000
20. Apron	1,631,000	3,155,000	3,430,000	5,120,000
21. Entrance Bridge	0	396,000	396,000	396,000
22. Surface & Subsurface Drainage	1,973,000	4,227,000	4,227,000	4,227,000
23. Sanitary Sewer	290,000	290,000	290,000	290,000
24. Water Supply	2,180,000	2,420,000	2,983,000	3,600,000
25. Heating and Air Conditioning	153,000	170,000	218,000	263,000
26. Lighting and Communications	1,400,000	3,120,000	3,425,000	3,622,000
27. Power and Steam Generation	472,000	1,055,000	1,055,000	1,230,000
28. Utility Tunnels	615,000	975,000	1,310,000	1,930,000
29. Elevators, Escalators	660,000	1,190,000	1,320,000	1,900,000
SUB-TOTALS	$ 33,636,000	$ 52,727,000	$ 59,091,000	$ 68,182,000
Engineering and Contingencies	3,364,000	5,273,000	5,909,000	6,818,000
TOTAL COST	37,000,000	$ 58,000,000	$ 65,000,000	$ 75,000,000

Annual Rates

	Per Cent	Per Cent	Per Cent	Per Cent
Coal Mining	4	4	4	4
Cotton and Woollen Textiles	3	3	3	3
Engineering and Shipbuilding	3	3	3	3
Iron and Steel	3	3	3	3
Railways	3	3	3	3
Shipping	3	3	3	3
Agriculture	3	3	3	3
Building	3	3	3	3
Chemicals	3	3	3	3
Distributive Trades	3	3	3	3
Electricity	3	3	3	3
Gas	3	3	3	3
Hotels and Catering	3	3	3	3
Laundries	3	3	3	3
Local Authorities	3	3	3	3
Paper and Printing	3	3	3	3
Pottery	3	3	3	3
Public Utilities and Omnibus Services	3	3	3	3
Rubber	3	3	3	3
Transport and Communications	3	3	3	3
Boot and Shoe Manufacture	3	3	3	3
Clothing	3	3	3	3
Distributive Trades	3	3	3	3
Electricity	3	3	3	3
Engineering	3	3	3	3
Gas	3	3	3	3
Hotels and Catering	3	3	3	3
Laundries	3	3	3	3
Local Authorities	3	3	3	3
Paper and Printing	3	3	3	3
Pottery	3	3	3	3
Public Utilities and Omnibus Services	3	3	3	3
Rubber	3	3	3	3
Transport and Communications	3	3	3	3

CAPITAL COSTS DISTRIBUTION

The capital cost distribution of the estimates for the 30, 45 and 60 plane position stages is made on the basis of allocating these costs to the three areas on the field: Landing Area, Terminal Area, and Rentable Area. The sum of the three areas equals the total airfield area. The purpose of the cost distribution is to properly assess the cost of annual maintenance and operation for each of the items of construction.

CAPITAL COSTS DISTRIBUTION

The desired cost distribution of the estimates for the [illegible] and [illegible] plans is made on the basis of dividing these costs by the three areas on the Field: Loading Area, Terminal Area, and Hotable Area. The use of these areas breaks the total Airfield area. The purpose of the cost distribution is to properly assess the case of annual maintenance and operation for each of the items of [illegible].

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CAPITAL COSTS DISTRIBUTION
1st STAGE - 30 LOADING POSITIONS

Item	% of Total Cost Allocated to Landing Area	Cost of Landing Area	% of Total Cost Allocated to Terminal Area	Cost of Terminal Area	% of Total Cost Allocated to Rentable Area	Cost of Rentable Area	TOTAL COST
1. Land Acquisition	53.5	3,210,000	4.6	276,000	41.9	2,514,000	6,000,000
2. Clearing and Grubbing	53.5	27,000	4.6	2,000	41.9	21,000	50,000
3. Earthwork and Grading	53.5	482,000	4.6	41,000	41.9	377,000	900,000
4. Fencing	60.0	136,000	-		40.0	91,000	227,000
5. Marking	100.0	17,000	-		-		17,000
6. Fueling	100.0	554,000	-		-		554,000
7. Air Line Building	-		100.0	5,450,000	-		5,450.000
8. Concourse Building	-		100.0	2,150,000	-		2,150,000
9. Office Building and Control Tower	-		100.0	502,000	-		502,000
10. Service and Cargo Building	-		100.0	1,330,000	-		1,330,000
11. Sidewalks	-		100.0	31,000	-		31,000
12. Obstructions	53.5	18,000	4.6	2,000	41.9	14,000	34,000
13. Parking Area	-		100.0	102,000	-		102,000
14. Railroad Relocation	53.5	1,605,000	4.6	138,000	41.9	1,257,000	3,000,000
15. Service Railroad	-		-		100.0	150,000	150,000
16. Roads	40.0	144,000	25.0	90,000	35.	126,000	360,000
17. Landscaping	70.0	119,000	5.0	9,000	25.	42,000	170,000
18. Runways	100.0	2,315,000	-		-		2,315,000
19. Taxiways	100.0	920,000	-		-		920,000
20. Apron	100.0	1,631,000	-		-		1,631,000
21. Entrance Building	-		-		-		0
22. Surface and Subsurface Drainage	53.5	1,055,000	4.6	91,000	41.9	827,000	1,973,000
23. Sanitary Sewer	-		80.	232,000	20.0	58,000	290,000
24. Water Supply	100.0	218,000	70.	1,526,000	20.0	436,000	2,180,000
25. Heating and Air Conditioning	-		100.0	153,000	-		153,000
26. Lighting and Communications	60.0	840,000	30.0	420,000	100.0	140,000	1,400,000
27. Power and Steam Generation	10.0	47,000	90.	425,000	-		472,000
28. Utility Tunnels	30.0	185,000	70.	430,000	-		615,000
29. Elevators and Escalators	-		100.	660,000			660,000
		13,523,000		14,060,000		6,053,000	33,636,000
							3,364,000
							37,000,000

CHECK CHANGED (CHECK BY CHANGE)

PAT JONES - 30 YEARS EXPERIENCE

GATLIN COUNTY DISTRICT ATTORNEY

| | | |

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CAPITAL COSTS DISTRIBUTION

2nd STAGE - 45 LOADING POSITIONS

	Item	% of Total Cost Allocated to Landing Area	Cost of Landing Area	% of Total Cost Allocated to Terminal Area	Cost of Terminal Area	% of Total Cost Allocated to Rentable Area	Cost of Rentable Area	TOTAL COST
1.	Land Acquisition	53.5	3,210,000	4.6	276,000	41.9	2,514,000	6,000,000
2.	Clearing and Grubbing	53.5	70,000	4.6	6,000	41.9	55,000	131,000
3.	Earthwork and Grading	53.5	1,150,000	4.6	99,000	41.9	901,000	2,150,000
4.	Fencing	60.0	136,000	-		40.	91,000	227,000
5.	Marking	100.0	58,000	-		-		58,000
6.	Fueling	100.	712,000	-		-		712,000
7.	Airline Building	-		100.	5,900,000	-		5,900,000
8.	Concourse Building	-		100.	2,680,000	-		2,680,000
9.	Office Building and Control Tower	-		100.	502,000	-		502,000
10.	Service and Cargo Building	-		100.	1,330,000	-		1,330,000
11.	Sidewalks	-		100.	31,000	-		31,000
12.	Obstructions	53.5	61,000	4.6	5,000	41.9	47,000	113,000
13.	Parking Area	-		100.	153,000			153,000
14.	Railroad Relocation	53.5	1,605,000	4.6	138,000	41.9	1,257,000	3,000,000
15.	Service Railroad	-		-		100.	540,000	540,000
16.	Roads	40.	256,000	25.	160,000	35.	224,000	640,000
17.	Landscaping	70.	396,000	5.0	28,000	25.0	141,000	565,000
18.	Runways	100.	9,307,000	-		-		9,307,000
19.	Taxiways	100.	1,690,000	-		-		1,690,000
20.	Apron	100.	3,155,000	-		-		3,155,000
21.	Entrance Building	-		100.0	396,000	-		396,000
22.	Surface and Subsurface Drainage	53.5	2,262,000	4.6	194,000	41.9	1,771,000	4,227,000
23.	Sanitary Sewer	-		80.0	232,000	20.0	58,000	290,000
24.	Water Supply	10.0	242,000	70.0	1,694,000	20.0	484,000	2,420,000
25.	Heating and Air Conditioning	-		100.0	170,000	-		170,000
26.	Lighting and Communications	60.0	1,872,000	30.	936,000	10.0	312,000	3,120,000
27.	Power and Steam Generation	10.	106,000	90.	949,000	-		1,055,000
28.	Utility Tunnels	30.	293,000	70.	682,000	-		975,000
29.	Elevators and Escalators	-		100.	1,190,000	-		1,190,000
			26,581,000		17,751,000		8,395,000	52,727,000
								5,273,000
								58,000,000

SECOND GENERAL (FEDERAL) CENSUS

CENSUS OF MANUFACTURES

PART XXIII. - PRODUCTS OF PETROLEUM

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CAPITAL COSTS DISTRIBUTION

3rd STAGE 60 LOADING POSITIONS

	Item	% of Total Cost Allocated to Landing Area	Cost of Landing Area	% of Total Cost Allocated to Terminal Area	Cost of Terminal Area	% of Total Cost Allocated to Rentable Area	Cost of Rentable Area	TOTAL COST
1.	Land Acquisition	53.5	3,210,000	4.6	276,000	41.9	2,514,000	6,000,000
2.	Clearing and Grubbing	53.5	70,000	4.6	6,000	41.9	55,000	131,000
3.	Earthwork and Grading	53.5	1,624,000	4.6	109,000	41.9	989,000	2,362,000
4.	Fencing	60.0	136,000	-		40.	91,000	227,000
5.	Marking	100.0	58,000	-		-		58,000
6.	Fueling	-	870 000	-		-		870,000
7.	Air Line Building	-		100.	6,340,000	-		6,340,000
8.	Concourse Building	-		100.	4,440,000	-		4,440,000
9.	Office Building and Control Tower	-		100.	502,000	-		502,000
10.	Service and Cargo Building	-		100.	1,615,000	-		1,615,000
11.	Sidewalks	-		100.	31,000	-		31,000
12.	Obstructions	53.5	61,000	4.6	5,000	41.9	47,000	113,000
13.	Parking Area			100.	204,000	-		204,000
14.	Railroad Relocation	53.5	1,605,000	4.6	138,000	41.9	1,257,000	3,000,000
15.	Service Railroad	-		-		100.	540,000	540,000
16.	Roads	40.0	369,000	25.	230,000	35.	322,000	921,000
17.	Landscaping	70.0	463,000	5.0	33,000	25.	165,000	661,000
18.	Runways	100.0	10,732,000	-		-		10,732,000
19.	Taxiways	100.0	1,690,000	-		-		1,690,000
20.	Apron	100.0	3,430,000	-		-		3,430,000
21.	Entrance Building	-		100.	396,000	-		396,000
22.	Surface and Subsurface Drainage	53.5	2,262,000	4.6	194,000	41.9	1,771,000	4,227,000
23.	Sanitary Sewer	-		80.0	232,000	20.0	58,000	290,000
24.	Water Supply	10.0	298,000	70.0	2,088,000	20.0	597,000	2,983,000
25.	Heating and Air Conditioning	-		100.0	218,000	-		218,000
26.	Lighting and Communications	60.0	2,055,000	30.0	1,027,000	10.0	343,000	3,425,000
27.	Power and Steam Generation	10.0	106,000	90.	949,000	-		1,055,000
28.	Utility Tunnels	30.0	393,000	70.	917,000	-		1,310,000
29.	Elevators and Escalators	-		100.0	1,320,000	-		1,320,000
			29,072,000		21,270,000		8,749,000	59,091,000
								5,909,000
								65,000,000

[illegible]

[illegible]

[illegible]

| [illegible] | [illegible] | [illegible] |

ANNUAL MAINTENANCE & OPERATION COSTS

A study was made of large airports throughout the United States to determine their representative annual operation and maintenance costs. Based on these studies, a percentage of the capital costs was derived to obtain the annual maintenance and operation costs. These percentages are applied to the capital costs of each construction stage, i.e. the 30,45 and 60 plane position stages, to obtain the projected annual charges, which are $1,171,000 for Stage I, $1,769,000 for Stage II, and $2,057,000 for Stage III.

ANNUAL PAYMENTS/PAX & CUMULATION CHARTS

CHICAGO ORCHARD (DOUGLAS) AIRPORT

ANNUAL MAINTENANCE AND OPERATION EXPENSE

Item	1. Maintenance and Operation Percent*	2. Stage I Costs (30 Positions)	3. Annual Maintenance and Operation Expense (Col. 1 x Col. 2)	4. Stage II Costs (45 Positions)	5. Annual Maintenance and Operation Expense (Col. 1 x Col. 4)	6. Stage III Costs (60 Positions)	7. Annual Maintenance and Operation Exp.(Col. 1 x Col.6)
1. Land Acquisition	-	6,000,000	-	6,000,000	-	6,000,000	-
2. Clearing and Grubbing	-	50,000	--	131,000	-	131,000	-
3. Earthwork and Grading	-	900,000	-	2,150,000	-	2,362,000	-
4. Fencing	10	227,000	22,700	227,000	22,700	227,000	22,700
5. Marking	10	17,000	1,700	58,000	5,800	58,000	5,800
6. Fueling	10	554,000	55,400	712,000	71,200	870,000	87,000
7. Air Line Building	7.2	5,450,000	392,400	5,900,000	424,800	6,340,000	456,500
8. Concourse Building	7.2	2,150,000	154,800	2,680,000	193,000	4,440,000	319,700
9. Office Building and Control Tower	7.2	502,000	36,100	502,000	36,100	502,000	36,100
10. Service and Cargo Building	7.2	1,330,000	95,600	1,330,000	95,800	1,615,000	116,300
11. Sidewalks	1.2	31,000	400	31,000	400	31,000	400
12. Obstructions	-	34,000	-	113,000	-	113,000	-
13. Parking Area	1.2	102,000	1,200	153,000	1,800	204,000	2,500
14. Railroad Relocation	-	3,000,000	-	3,000,000	-	3,000,000	-
15. Service Railroad	1.2	150,000	1,800	540,000	6,500	540,000	6,500
16. Roads	1.2	360,000	4,300	640,000	7,700	921,000	11,100
17. Landscaping	10	170,000	17,000	565,000	56,500	661,000	66,100
18. Runways	1.2	2,315,000	27,800	9,307,000	111,800	10,732,000	128,800
19. Taxiways	1.2	920,000	11,000	1,690,000	20,300	1,690,000	20,300
20. Apron	1.2	1,631,000	19,600	3,155,000	37,900	3,430,000	41,200
21. Entrance Building	7.2	-	-	396,000	28,500	396,000	28,500
22. Surface and Subsurface Drainage	1.2	1,973,000	23,700	4,227,000	50,700	4,227,000	50,700
23. Sanitary Sewer	1.2	290,000	3,500	290,000	3,500	290,000	3,500
24. Water Supply	1.2	2,180,000	26,100	2,420,000	29,000	2,983,000	35,800
25. Heating and Air Conditioning	10.	153,000	15,300	170,000	17,000	218,000	21,800
26. Lighting and Communications	10.	1,400,000	140,000	3,120,000	312,000	3,425,000	342,500
27. Power and Steam Generation	10.	472,000	47,200	1,055,000	105,500	1,055,000	105,500
28. Utility Tunnels	1.2	615,000	7,400	975,000	11,700	1,310,000	15,700
29. Elevators and Escalators	10	660,000	66,000	1,190,000	119,000	1,320,000	132,000
		53,636,000	1,171,000	52,727,000	1,769,000	59,091,000	2,057,000

* This percent of the capital cost of each item is assumed to be the Annual Maintenance and Operation Expense.

ORDINARY EXPENDITURE (CURRENT) AND CAPITAL EXPENDITURE

ANNUAL EXPENDITURE AND CAPITAL EXPENDITURE ESTIMATES

Item	Actual Expenditure 1 July 1969 to 30 June 1970	Estimated Expenditure 1 July 1970 to 30 June 1971	Budget Estimates 1 July 1971 to 30 June 1972	Budget Estimates 1 July 1972 to 30 June 1973	Budget Estimates 1 July 1973 to 30 June 1974	Budget Estimates 1 July 1974 to 30 June 1975
	$	$	$	$	$	$
Town Hall						
Town Hall Maintenance						
Town Hall Cleaning						
Town Hall Electricity						
Town Hall Water						
Town Hall Insurance						
Town Hall Telephone						
Town Hall Sundries						
Civic Centre						
Civic Centre Maintenance						
Civic Centre Cleaning						
Civic Centre Electricity						
Civic Centre Water						
Civic Centre Insurance						
Civic Centre Telephone						
Civic Centre Sundries						
Civic Centre Building						
Civic Centre Building Maintenance						
Civic Centre Building Cleaning						
Civic Centre Building Electricity						
Civic Centre Building Water						
Civic Centre Building Insurance						
Civic Centre Building Telephone						
Civic Centre Building Sundries						
Civic Centre Building Furniture						
Civic Centre Building Furniture Maintenance						
Civic Centre Building Furniture Cleaning						
Civic Centre Building Furniture Electricity						
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Flying Revenue

Estimated revenues from the flying operation of the airport as detailed in the following pages are based upon current and past charges in effect at Chicago Municipal Airport and to some extent in existence at other major airports. The total of such revenues is important in fixing the feasibility of revenue financing to cover part of capital costs. The individual estimates of charges are not necessarily recommended. A reference to the distribution of capital costs shows the inequity of some of the charges. Landing fees may be entirely too low while area rentals are too high. Before final adoption of individual schedules of charges a careful evaluation of their relation to capital costs is recommended.

Flying Qualities

Information received from the flying operation of the airplane
as detailed in the following paragraphs has been obtained pri-
marily on the Chance-Vought Airsprint and to some extent in
comparison to other fighter airplanes. The total of these investi-
gations is that the Convertiplane is considered to have good
stability and control characteristics in hovering flight and
during transition to normal cruising flight.

Longitudinal stability is considered satisfactory
since the airplane tends to return to trim after disturbance
from the trim condition. Control forces are considered
light and the airplane responds well to control inputs
during the transition from hovering to normal cruising
flight. The longitudinal stability of the airplane can be
easily changed by a relocation of the center of gravity
of duplicate weights. The additional advantage of being
able to control the airplane's attitude by means of control
surfaces in the propeller slipstream at hovering flight
speeds is considered to be a decided advantage.

LANDING FEES

The landing fees at Municipal Airport for scheduled passenger flights are based on two factors. The first factor is a sliding scale according to the frequency of schedules. The rates are as follows:

$200.00 per month per daily schedule for the first 3 schedules,

$100.00 " " " " " " " next " "

$ 50.00 " " " " " " " " " "

$ 25.00 " " " " " " each additional schedule.

The second factor in the determination of landing fees is the gross weight of the airplane. The above rates are basic for an airplane with a licensed gross weight not in excess of 25,500 pounds. If the gross weight is in excess of 25,500 pounds, an additional fee of $1.00 is charged for each 1,000 pounds weight which is in excess of the basic 25,500 pounds. The graph on the following page shows the projected growth of gross weight of the average scheduled airliner.

To determine what the average fee is for the sliding scale portion, it is necessary to determine the number of daily schedules during the particular year in question, and also to distribute the flights to the various airlines using the airport in proportion to each particular airline's traffic volume.

The table below shows a sample calculation for the ultimate year.

Number of Scheduled Arrivals and Departures in Ultimate Year is 567,000. The average number of arrivals per day during this year is:

$$\frac{567{,}000}{2 \times 365} = 775$$

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Airline	Percent of Total Traffic*	Number of Daily Schedules Col.2x775	First 3 Schedules at $200.00 each	Next 3 Schedules at $100.00 each	Next 3 Schedules at $ 50.00 each	Number of Additional Schedules	Additional Scheduled at $25.00 each Col.7x$25	Total Payment Col. 4-5-6-8
A	27.0	208	$600.	$300.	$150.	199	$ 4975.	$ 6025.
B	6.0	47	600.	300.	150.	38	950.	2000.
C	19.7	153	600.	300.	150.	144	3600.	4650.
D	6.6	51	600.	300.	150.	42	1050.	2100.
E	4.2	32	600.	300.	150.	23	575.	1625.
F	16.8	130	600.	300.	150.	121	3025.	4075.
G	3.5	28	600.	300.	150.	19	475.	1525.
H	10.2	79	600.	300.	150.	70	1750.	2800.
I	6.0	47	600.	300.	150.	38	950.	2000.
	100.0	775						$26,800.

* Based on Dec. 1947 Schedules

Therefore, Average Fee per Schedule = $26,800/775 = $35.00

LANDING TIMES

The landing fees at Manfredia Airport for scheduled commercial flights are based on the landing. The first factor is a landing charge according to the frequency of occurrence. The rates are as follows:

| | | |

DERIVATION OF AVERAGE MONTHLY LANDING FEE

(1) YEAR	(2) GROSS WEIGHT OF AVERAGE SCHEDULED AIRLINER	(3) WEIGHT IN EXCESS OF 25,500 POUNDS	(4) AVERAGE EXCESSIVE WEIGHT CHARGE	(5) ANNUAL SCHEDULED ARRIVALS & DEPARTURES	(6) NUMBER OF SCHEDULES DAILY	(7) MONTHLY CHARGE PER SCHEDULE	(8) TOTAL AVERAGE MONTHLY LANDING FEE PER SCHEDULE
		COL.(2) Minus 25,500	Col.(3)x$1.00 / 1000 lbs.		Col.(5) / 365 x 2	See Graph	Col. (4) plus Col. (7)
1951	52,500	27,000	27.00	170,150	233	$ 62.00	$ 89.00
1952	56,000	30,500	30.50	194,600	267	58.00	88.50
1953	60,000	34,500	34.50	211,900	290	53.50	88.00
1954	64,000	38,500	38.50	251,300	344	50.00	88.50
1955	69,000	43,500	43.50	280,000	384	46.50	90.00
1956	74,000	48,500	48.50	304,000	416	43.00	91.50
1957	77,500	52,000	52.00	322,700	443	42.00	94.00
1958	81,000	55,500	55.50	340,900	466	41.50	96.00
1959	83,000	57,500	57.50	354,900	486	41.00	98.50
1960	86,000	60,500	60.50	368,800	505	40.00	100.50
1961	88,500	63,000	63.00	379,900	520	39.50	102.50
1962	90,000	64,500	64.50	386,500	528	39.50	104.00
1963	91,500	66,000	66.00	391,900	536	39.00	105.00
1964	92,500	67,000	67.00	392,600	539	39.00	106.00
1965	94,000	69,000	68.50	394,000	540	38.50	107.00
1966	95,000	69,500	69.50	395,100	541	38.50	108.00
1967	95,500	70,000	70.00	395,500	542	38.50	108.50
1968	96,000	70,500	70.50	396,500	544	38.50	109.00
1969	96,500	71,000	71.00	396,700	544	38.00	109.00
1970	97,000	71,500	71.50	396,900	544	38.00	109.50
1971	97,200	71,700	71.70	397,000	544	37.80	109.50
1972	97,700	72,200	72.20	397,100	544	37.80	110.00
1973	97,700	72,200	72.20	397,200	544	37.80	110.00
1974	98,250	72,750	72.75	397,300	545	37.75	110.50
1975	98,750	73,250	73.25	397,400	545	37.75	111.00
1976	98,750	73,250	73.25	397,450	545	37.75	111.00
1977	99,000	73,500	73.50	397,500	545	37.50	111.00

TREASURY OF CANADA MONTHLY INCOME TAX

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
DATE	GROSS PAYROLL IN MILLIONS OF DOLLARS	GROSS PAYROLL IN MILLIONS OF 1971 DOLLARS	AVERAGE WEEKLY EARNINGS	EMPLOYMENT IN THOUSANDS	UNEMPLOYMENT RATE	INCOME TAX DEDUCTIONS IN MILLIONS OF DOLLARS	INCOME TAX DEDUCTIONS IN MILLIONS OF 1971 DOLLARS	AVERAGE INCOME TAX DEDUCTIONS PER EMPLOYEE	AVERAGE INCOME TAX DEDUCTIONS PER EMPLOYEE IN 1971 DOLLARS	INCOME TAX DEDUCTIONS AS A PERCENT OF GROSS PAYROLL
1961										
FEB	2,000	5,000	80.00	5,000	5.0	400	1,000	80.00	200.00	20.0
MAR	2,100	5,200	84.00	5,100	4.8	420	1,040	82.35	203.92	20.0
APR	2,200	5,400	88.00	5,200	4.6	440	1,080	84.62	207.69	20.0
MAY	2,300	5,600	92.00	5,300	4.4	460	1,120	86.79	211.32	20.0
JUN	2,400	5,800	96.00	5,400	4.2	480	1,160	88.89	214.81	20.0
JUL	2,500	6,000	100.00	5,500	4.0	500	1,200	90.91	218.18	20.0
AUG	2,600	6,200	104.00	5,600	3.8	520	1,240	92.86	221.43	20.0
SEP	2,700	6,400	108.00	5,700	3.6	540	1,280	94.74	224.56	20.0
OCT	2,800	6,600	112.00	5,800	3.4	560	1,320	96.55	227.59	20.0
NOV	2,900	6,800	116.00	5,900	3.2	580	1,360	98.31	230.51	20.0
DEC	3,000	7,000	120.00	6,000	3.0	600	1,400	100.00	233.33	20.0
1962										
JAN	3,100	7,200	124.00	6,100	2.8	620	1,440	101.64	236.07	20.0
FEB	3,200	7,400	128.00	6,200	2.6	640	1,480	103.23	238.71	20.0
MAR	3,300	7,600	132.00	6,300	2.4	660	1,520	104.76	241.27	20.0
APR	3,400	7,800	136.00	6,400	2.2	680	1,560	106.25	243.75	20.0
MAY	3,500	8,000	140.00	6,500	2.0	700	1,600	107.69	246.15	20.0
JUN	3,600	8,200	144.00	6,600	1.8	720	1,640	109.09	248.48	20.0
JUL	3,700	8,400	148.00	6,700	1.6	740	1,680	110.45	250.75	20.0
AUG	3,800	8,600	152.00	6,800	1.4	760	1,720	111.76	252.94	20.0
SEP	3,900	8,800	156.00	6,900	1.2	780	1,760	113.04	255.07	20.0
OCT	4,000	9,000	160.00	7,000	1.0	800	1,800	114.29	257.14	20.0
NOV	4,100	9,200	164.00	7,100	0.8	820	1,840	115.49	259.15	20.0
DEC	4,200	9,400	168.00	7,200	0.6	840	1,880	116.67	261.11	20.0
1963										
JAN	4,300	9,600	172.00	7,300	0.4	860	1,920	117.81	263.01	20.0
FEB	4,400	9,800	176.00	7,400	0.2	880	1,960	118.92	264.86	20.0
MAR	4,500	10,000	180.00	7,500	0.0	900	2,000	120.00	266.67	20.0
APR	4,600	10,200	184.00	7,600	0.2	920	2,040	121.05	268.42	20.0
MAY	4,700	10,400	188.00	7,700	0.4	940	2,080	122.08	270.13	20.0
JUN	4,800	10,600	192.00	7,800	0.6	960	2,120	123.08	271.79	20.0
JUL	4,900	10,800	196.00	7,900	0.8	980	2,160	124.05	273.42	20.0
AUG	5,000	11,000	200.00	8,000	1.0	1,000	2,200	125.00	275.00	20.0
SEP	5,100	11,200	204.00	8,100	1.2	1,020	2,240	125.93	276.54	20.0
OCT	5,200	11,400	208.00	8,200	1.4	1,040	2,280	126.83	278.05	20.0
NOV	5,300	11,600	212.00	8,300	1.6	1,060	2,320	127.71	279.52	20.0
DEC	5,400	11,800	216.00	8,400	1.8	1,080	2,360	128.57	280.95	20.0

CHICAGO ORCHARD (DOUGLAS) AIRPORT

REVENUE FROM SCHEDULED AIRLINE LANDING FEES

(1) YEAR	(2) ANNUAL SCHEDULED ARRIVALS & DEPARTURES	(3) NUMBER OF SCHEDULES DAILY Col.(2) / 365 x 2	(4) AVERAGE MONTHLY LANDING FEE PER SCHEDULE (See Graph)	(5) ANNUAL REVENUE FROM SCHEDULED LANDING FEES Col.(3) x Col.(4) x 12 MO.
1951	170,150	233	$ 89.00	$ 249,000
1952	194,600	267	88.50	284,000
1953	211,900	290	88.00	306,000
1954	251,300	344	88.50	365,000
1955	280,000	384	90.00	415,000
1956	304,000	416	91.50	463,000
1957	322,700	443	94.00	500,000
1958	340,900	466	96.00	537,000
1959	354,900	486	98.50	574,000
1960	368,800	505	100.50	609,000
1961	379,900	520	102.50	640,000
1962	386,500	528	104.00	659,000
1963	391,900	536	105.00	675,000
1964	392,600	539	106.00	686,000
1965	394,000	540	107.00	693,000
1966	395,100	541	108.00	701.00
1967	395,600	542	108.50	706,000
1968	396,500	544	109.00	712,000
1969	396,700	544	109.00	712,000
1970	396,900	544	109.50	715,000
1971	397,000	544	109.50	715,000
1972	397,100	544	110.00	718,000
1973	397,200	544	110.00	718,000
1974	397,300	545	110.50	723,000
1975	397,400	545	111.00	726,000
1976	397,450	545	111.00	726,000
1977	397,500	545	111.50	730,000

(1)	(2)	(3)	(4)	(5)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ANNUAL INCOME FROM BUILDING RENTALS

A study was made of the average unit charges to be made for the rental of various building areas. These unit charges are based on the average unit charges which are made for different uses in existing airport terminal buildings throughout the United States. It will be noted in the Airline building, for example, that $3.00 per square foot is charged for the upper floor, whereas $2.00 per square foot is charged for the lower floor.

REMOVE INCORE TRUE BUILDING CONTENTS

A study was made of the economic unit changes to be made for the period of various building areas. These unit changes are based on the economic unit changes which are made for different uses in existing airport buildings. It will be noted in this building, for example, that $1.10 per square foot is charged for the upper floor, whereas $1.65 per square foot is charged for the lower floor.

CHICAGO ORCHARD (DOUGLAS) AIRPORT

	ANNUAL INCOME FROM BUILDING RENTALS		
	30 POSITIONS	45 POSITIONS	60 POSITIONS
A. OFFICE BUILDING AND CONTROL TOWER Net Area = 27,700 sq. ft. at $2.00 per sq. ft. in all stages	$ 55,400	$ 55,400	$ 55,400
B. AIRLINE BUILDING			
1. 30 Positions - Upper Floor Net Area = 156,100 x $3.00 per sq. ft.	468,300		
2. 30 Positions - Lower Floor Net Area = 85,800 x $2.00 per sq. ft.	171,600		
3. 45 Positions - Upper Floor Net Area = 200,100 x $3.00 per sq. ft.		609,300	
4. 45 Positions - Lower Floor Net Area = 85,800 x $2.00 per sq. ft.		171,600	
5. 60 Positions - Upper Floors Net Area = 260,000 x $3.00 per sq. ft.			780,000
6. 60 Positions - Lower Floors Net Area = 143,000 x $2.00 per sq. ft.			286,000
C. UTILITY BUILDING			
1. 30 Positions Net Area = 47,900 x 60% (Rented) x $1.50	43,000		
2. 45 Positions Net Area = 47,900 x 60% (Rented) x $1.50		43,000	
3. 60 Positions Net Area = 58,000 x 60% (Rented) x $1.50			52,000
TOTAL RENTAL INCOME	$ 738,300	$ 870,300	$1,173,400

CHICAGO ORCHARD (DOUGLAS) AIRPORT

FIELD AREA RENTALS

Rentals based on prevailing Chicago Municipal Airport rentals of 6¢ per square foot annually for actual area occupied by buildings. There is a total of approximately one billion square feet available for rental at Chicago Orchard Airport.

STAGE I 30 POSITIONS

Number of square feet occupied by hangars and shops	2,745,000
Number of square feet occupied by aprons and aircraft storage areas (away from terminal area).	5,490,000
Total Area	8,235,000 sq. ft.

Annual Rental $165,000

STAGE II 45 POSITIONS

Number of square feet occupied by hangars and shops	3,455,000
Number of square feet occupied by aprons and aircraft storage areas (away from terminal area).	6,910,000
Total Area	10,365,000 sq. ft.

Annual Rental $207,000

STAGE III 60 POSITIONS

Number of square feet occupied by hangars and shops	4,165,000
Number of square feet occupied by aprons and aircraft storage areas (away from terminal area).	8,330,000
Total Area	12,495,000 sq. ft.

Annual Rental $250,000

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[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [

FUELING REVENUES

It is assumed that the fueling requirements of aircraft will increase proportionately with growth of passenger capacity.

The growth of the average number of passengers per plane was derived from a study of the growth of size of airplanes at their consequently larger seating capacity.

The average gasoline consumption was multiplied by the number of scheduled aircraft movements per year to obtain the amount of gasoline consumed per year by scheduled aircraft. A unit revenue of $0.0033 per gallon of gasoline consumed was adopted to obtain the annual gasoline revenue from scheduled aircraft.

INDEX EXERCISE

CHICAGO ORCHARD (DOUGLAS) AIRPORT

FUELING REVENUES

1	2	3	4	5	6
YEAR	AVERAGE NUMBER OF PASSENGERS PER PLANE	AVERAGE NUMBER OF GALLONS OF GAS PER FUELING	NUMBER OF SCHEDULED AIRCRAFT MOVEMENTS PER YEAR	NUMBER OF GALLONS OF GAS CONSUMED PER YEAR BY SCHEDULED AIRCRAFT	ANNUAL GASOLINE REVENUE FROM SCHEDULED AIRCRAFT
1951	28.6	563	170,150	47,850,000	158,000
1952	29.2	575	194,600	55,950,000	185,000
1953	29.9	589	211,900	65,350,000	216,000
1954	30.6	603	251,300	75,770,000	250,000
1955	31.2	615	280,000	86,100,000	284,000
1956	31.5	626	304,000	95,310,000	315,000
1957	32.5	640	322,700	103,260,000	341,000
1958	33.1	652	340,900	111,130,000	367,000
1959	33.8	665	354,900	118,000,000	389,000
1960	34.4	677	368,800	124,700,000	412,000
1961	35.0	690	379,900	131,130,000	433,000
1962	35.5	700	386,500	135,240,000	446,000
1963	36.0	709	391,900	138,960,000	459,000
1964	36.5	719	392,600	141,180,000	466,000
1965	36.9	726	394,000	143,060,000	472,000
1966	37.2	733	395,100	144,800,000	478,000
1967	37.5	739	395,500	146,270,000	483,000
1968	37.8	745	396,500	147,660,000	487,000
1969	38.0	749	396,700	148,600,000	490,000
1970	38.2	753	396,900	149,470,000	493,000
1971	38.4	756	397,000	150,090,000	495,000
1972	38.5	758	397,100	150,480,000	497,000
1973	38.5	758	397,200	150,500,000	497,000
1974	38.6	760	397,300	150,900,000	498,000
1975	38.6	760	397,400	150,900,000	498,000
1976	38.7	762	397,450	151,300,000	499,000
1977	38.7	762	397,500	151,300,000	499,000
		$\frac{563 \times \text{Col. } 2}{28.6}$ = 19.7 x Col. 2		$\frac{\text{Col. } 3 \times \text{Col. } 4}{2}$	Col. 5 x $.0033 per gallon

| | | |

CHICAGO ORCHARD (DOUGLAS) AIRPORT

FLYING REVENUE SUMMARY

	YEAR	LANDING FEES	CENTRAL TERMINAL RENTALS	FIELD AREA RENTALS	FUELING REVENUE	TOTAL FLYING REVENUE
STAGE I	1951	249,000	738,000	165,000	158,000	1,310,000
30	1952	284,000	738,000	165,000	185,000	1,372,000
POSITIONS	1953	306,000	738,000	165,000	216,000	1,425,000
	1954	365,000	870,000	207,000	260,000	1,692,000
STAGE II	1955	415,000	870,000	207,000	284,000	1,776,000
45	1956	463,000	870,000	207,000	315,000	1,855,000
POSITIONS	1957	500,000	870,000	207,000	341,000	1,918,000
	1958	637,000	1,173,000	250,000	367,000	2,327,000
	1959	574,000	1,173,000	250,000	389,000	2,386,000
	1960	609,000	1,173,000	250,000	412,000	2,444,000
	1961	640,000	1,173,000	250,000	433,000	2,496,000
	1962	659,000	1,173,000	250,000	446,000	2,528,000
	1963	675,000	1,173,000	250,000	459,000	2,557,000
	1964	686,000	1,173,000	250,000	466,000	2,575,000
STAGE III	1965	693,000	1,173,000	250,000	472,000	2,588,000
60	1966	701,000	1,173,000	250,000	478,000	2,602,000
POSITIONS	1967	706,000	1,173,000	250,000	483,000	2,612,000
	1968	712,000	1,173,000	250,000	487,000	2,622,000
	1969	712,000	1,173,000	250,000	490,000	2,625,000
	1970	715,000	1,173,000	250,000	493,000	2,631,000
	1971	715,000	1,173,000	250,000	495,000	2,633,000
	1972	718,000	1,173,000	250,000	497,000	2,638,000
	1973	718,000	1,173,000	250,000	497,000	2,638,000
	1974	723,000	1,173,000	250,000	498,000	2,644,000
	1975	726,000	1,173,000	250,000	498,000	2,647,000
	1976	726,000	1,173,000	250,000	499,000	2,648,000
	1977	730,000	1,173,000	250,000	499,000	2,652,000

| | | |

NON-FLYING REVENUE

For simplicity, all the revenue from passengers, visitors, and spectators is lumped together in the following table. The total revenue for the ultimate year has been computed in detail on the large sheet entitled, "NON-FLYING REVENUE ANALYSIS FOR ULTIMATE YEAR." If the total non-flying revenue is divided by the number of passenger movements, it provides us with a covenient way of estimating the year by year non-flying revenue. This per passenger movement income is multiplied by the number of passenger movements annually and furnishes the annual non-flying revenue.

All the non-flying revenue is the money that is paid to the airport in lieu of rent. This money is received as a per cent of the gross income of the various concessions rather than as a rental on a square foot basis.

NON-ELECTION PROVISIONS

Each of a series of 3 clauses [1-3 long]:

Ten [10] days after the first Tuesday following the date of the election referred to in the preceding [1st] clause, [1] there shall be published in the [1] newspaper in [1] county designated by the [1] Secretary of State [1] qualified for the purpose of publishing election notices, [1] one [1] such election notice [1] [2-3 long] [1] [2-3 long] [1] [2-3 long]

CONCESSIONS	15,650,000 PASS		090,000 INDIV'LS	TOTALS	
	% PASS-ENGER USING FACILITY	AMOUNT SPENT PER PASS-ENGER	NET SPECTATOR REVENUE	GROSS	NET
RESTAURANT	2	1.25	40,000	722,000	109,000
COFFEE SHOP	8	.60	91,000	1,971,000	179,000
SODA FOUNTAIN	10	.15	38,000	657,000	78,000
PERIODICALS, CIGARS, SOUVENIRS	70	.12	136,000	2,217,000	442,000
PERSONAL SERVICES	10	.50	4,000	763,000	77,000
MISCELLANEOUS SALES & SERVICE	30	.10	37,000	731,000	147,000
PARKING LOT	3	.35	246,000	885,000	796,000
SHOWS & SPECTACLES, ETC.	5	.25	46,000	532,000	80,000
HOTELS	.1	3.50	1,000	133,000	13,000
OBSERVATION DECK	1	.10	492,000	583,000	524,000
VARIOUS TRANSPORTATION	20	1.00	6,000	3,089,000	308,000
T O T A L S			1,140,000	12,103,000	2,753,000

RESEARCH: J.L.D. - I.L. 2-19-
Borough

REPORT 100
(A)

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[illegible] and conversion is [illegible] to the [illegible] rather. The [illegible] of the [illegible] [illegible] [illegible] to [illegible] on the [illegible] [illegible] [illegible]

CHICAGO ORCHARD (DOUGLAS) AIRPORT

NON-FLYING REVENUE ANALYSIS FOR ULTIMATE YEAR

CONCESSIONS	PASSENGERS 15,650,000 PASS'G MOVEMENTS X 0.90=14,100,000 INDVS.					VISITORS 8,340,000 VISITOR MOV'TS X 0.50=4,170,000 INDIVD'LS.					SPECTATORS 12,180,000 SPECTATOR MOVE'TS X 0.50=6,090,000 INDIV'LS					TOTALS	
	% PASS-ENGER USING FACILITY	AMOUNT SPENT PER PASS-ENGER	% REVENUE PER PASS-ENGER	GROSS PASSENGER REVENUE	NET PASSENGER REVENUE	% VISITORS USING FACILITY	AMOUNT SPENT PER VISITOR	% REVENUE PER VISITOR	GROSS VISITOR REVENUE	NET VISITOR REVENUE	% SPECTA-TORS USING FACIL-ITIES	AMOUNT SPENT PER SPECT-ATOR	% REVENUE PER SPECTA-TOR	GROSS SPECTATOR REVENUE	NET SPECTATOR REVENUE	GROSS	NET
RESTAURANT	2	1.25	15	352,000	53,000	2	1.25	15	104,000	16,000	3.5	1.25	15	266,000	40,000	722,000	109,000
COFFEE SHOP	8	.60	10	677,000	68,000	8	.60	10	200,000	20,000	25	.60	10	914,000	91,000	1,971,000	179,000
SODA FOUNTAIN	10	.15	12	212,000	25,000	20	.15	12	125,000	15,000	35	.15	12	320,000	38,000	657,000	78,000
PERIODICALS, CIGARS, SOUVENIRS	70	.12	20	1,184,000	236,000	70	.12	20	351,000	70,000	70	.16	20	682,000	136,000	2,217,000	442,000
PERSONAL SERVICES	10	.50	10	705,000	71,000	1	.50	10	21,000	2,000	2	.30	10	37,000	4,000	763,000	77,000
MISCELLANEOUS SALES & SERVICE	30	.10	20	423,000	85,000	30	.10	20	125,000	25,000	30	.10	20	183,000	37,000	731,000	147,000
PARKING LOT	3	.35	90	148 000	133,000	37	.30	90	463,000	417,000	18	.25	90	274,000	246,000	885,000	796,000
SHOWS & SPECTACLES, ETC.	5	.25	15	176,000	26,000	5	.25	15	52,000	8,000	20	.25	15	304,000	46,000	532,000	80,000
HOTELS	.1	3.50	10	49,000	5,000	.5	3.50	10	73,000	7,000	.05	3.50	10	11,000	1,000	133,000	13,000
OBSERVATION DECK	1	.10	90	14,000	13,000	5	.10	90	21,000	19,000	90	.10	90	548,000	492,000	583,000	524,000
VARIOUS TRANSPORTATION	20	1.00	10	2,820,000	281,000	5	1.00	10	208,000	21,000	1	1.00	10	61,000	6,000	3,089,000	308,000
TOTALS				6,760,000	998,000				1,743,000	621,000				3,600,000	1,140,000	12,103,000	2,753,000

RESEARCH: J.L.D. - I.L. 2-19-48

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REPORT 100
(A)

REVENUE FROM NON-FLYING CONCESSIONS (Con't)

(1) YEAR	(2) NUMBER OF PASSENGER MOVEMENTS	(3) CONCESSION REVENUE Col.(2)x$0.17589*
1951	4,960,000	$ 872,000
1952	5,800,000	1,020,000
1953	6,750,000	1,187,000
1954	7,840,000	1,379,000
1955	8,900,000	1,565,000
1956	9,850,000	1,733,000
1957	10,750,000	1,891,000
1958	11,500,000	2,023,000
1959	12,210,000	2,148,000
1960	12,900,000	2,269,000
1961	13,520,000	2,378,000
1962	13,950,000	2,454,000
1963	14,330,000	2,524,000
1964	14,600,000	2,568,000
1965	14,700,000	2,586,000
1966	15,000,000	2,638,000
1967	15,130,000	2,661,000
1968	15,280,000	2,688,000
1969	15,380,000	2,705,000
1970	15,420,000	2,712,000
1971	15,500,000	2,726,000
1972	15,580,000	2,740,000
1973	15,600,000	2,744,000
1974	15,620,000	2,747,000
1975	15,620,000	2,747,000
1976	15,650,000	2,753,000
1977	15,650,000	2,753,000

* $2,759,000/15,650,000 Passenger Movements - $0.17589 per Passenger Movement.

Statement Showing Non-Current Investments (Contd.)

(1)	(2)	(3)
Year	Movement of Investments	Income Earned
1941	4,324,000	4,876,000
1942	5,210,000	4,091,000
1943	6,780,000	1,341,000
1944	7,640,000	1,373,000
1945	8,000,000	1,369,000
1946	9,000,000	1,123,000
1947	10,750,000	1,054,000
1948	11,320,000	1,045,000
1949	12,000,000	1,184,000
1950	13,000,000	1,078,000
1951	13,800,000	2,678,000
1952	14,400,000	2,948,000
1953	14,700,000	3,209,000
1954	15,000,000	3,586,000
1955	15,000,000	3,628,000
1956	15,000,000	3,603,000
1957	15,140,000	3,603,000
1958	15,850,000	3,658,000
1959	16,200,000	3,705,000
1960	16,650,000	3,738,000
1961	16,900,000	3,760,000
1962	17,200,000	3,780,000
1963	17,500,000	3,824,000
1964	17,800,000	3,847,000
1965	18,000,000	3,873,000
1966	18,250,000	3,893,000
1967	18,500,000	3,914,000

* Rs.134,000(13,000,000 Debentures Redeemed - Rs.11250 Re-
Investment Allowance).

CHICAGO ORCHARD (DOUGLAS) AIRPORT

REVENUE AND EXPENSE SUMMARY

	Col. (1)	Col. (2)	Col. (3)	Col. (4)	Col. (5)	Col. (6)
	YEAR	FLYING REVENUE	NON-FLYING REVENUE	TOTAL REVENUE (Col.2 plus Col.3)	MAINTENANCE and OPERATION	NET INCOME BEFORE DEBT SERVICE (Col. 4 - Col. 5)
Stage I	1951	$ 1,310,000	$ 872,000	$ 2,182,000	$ 1,171,000	$ 1,011,000
30	1952	1,372,000	1,020,000	2,392,000	1,171,000	1,221,000
Positions	1953	1,425,000	1,187,000	2,612,000	1,171,000	1,441,000
	1954	1,692,000	1,379,000	3,071,000	1,769,000	1,302,000
Stage II	1955	1,776,000	1,565,000	3,341,000	1,769,000	1,572,000
45	1956	1,855,000	1,733,000	3,588,000	1,769,000	1,819,000
Positions	1957	1,918,000	1,891,000	3,809,000	1,769,000	2,040,000
	1958	2,327,000	2,023,000	4,350,000	2,057,000	2,293,000
	1959	2,386,000	2,148,000	4,534,000	2,057,000	2,477,000
	1960	2,444,000	2,269,000	4,713,000	2,057,000	2,656,000
	1961	2,496,000	2,378,000	4,874,000	2,057,000	2,817,000
	1962	2,528,000	2,454,000	4,982,000	2,057,000	2,925,000
	1963	2,557,000	2,524,000	5,081.000	2,057,000	3,024,000
	1964	2,575,000	2,568,000	5,143,000	2,057,000	3,086,000
Stage III	1965	2,588,000	2,586,000	5,174,000	2,057,000	3,117,000
60	1966	2,602,000	2,638,000	5,240,000	2,057,000	3,183,000
Positions	1967	2,612,000	2,661,000	5,273,000	2,057,000	3,216,000
	1968	2,622,000	2,688,000	5,310,000	2,057,000	3,253,000
	1969	2,625,000	2,705,000	5,330,000	2,057,000	3,273,000
	1970	2,631,000	2,712,000	5,343,000	2,057,000	3,286,000
	1971	2,633,000	2,726,000	5,359,000	2,057,000	3,302,000
	1972	2,638,000	2,740,000	5,378,000	2,057,000	3,321,000
	1973	2,638,000	2,744,000	5,382,000	2,057,000	3,325,000
	1974	2,644,000	2,747,000	5,391,000	2,057,000	3,334,000
	1975	2,647,000	2,747,-00	5,394,000	2,057,000	3,337,000
	1976	2,648,000	2,753,000	5,401,000	2,057,000	3,344,000
	1977	2,652,000	2,753,000	5,405,000	2,057,000	3,348,000

DEPENSES COURANTES (DONT PAIE) (suite)

DEPENSES PAR CHAPITRES

Chap. (1)	Libellé	Ord.	Crédits votés	Crédits ouverts	Dépenses ordonnancées	Chap. (1)	Libellé	Ord.	Crédits votés	Crédits ouverts	Dépenses ordonnancées
	Titre I						Titre II				
	Dépenses ordinaires						Dépenses en capital				
	Section I						Section II				
	Pouvoirs publics						Equipement				

SUGGESTED REVENUE BOND SCHEDULE

DEBT SERVICE; BONDS ARE DATED JANUARY 1, 1948 ANR ARE DUE DECEMBER 31, 1977. INTEREST TO BE 4%. THESE BONDS ARE TO BE RETIRED BY SINKING FUND OPERATIONS AT THE PREMIUMS SHOWN BELOW

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
YEAR	BONDS ISSUED	MINIMUM PRINCIPAL RETIRED ON DEC. 31	NET REVENUE FROM OPERATIONS BEFORE DEBT SERVICE	INTEREST AT 4% Col. (9) x .04	BALANCE TO SINKING FUND Col. (4) - Col.(5)	SINKING FUND BALANCE	BONDS RETIRED On DEC. 31	BALANCE OUTSTANDING ON JANUARY 1st	CALL PREMIUMS RATE	CALL PREMIUM AMOUNT Col.(8) x .04
1948	6,363,000			254,500 (1)				6,363,000		
1949	5,000,000			454,500 (1)				11,363,000		
1950	5,000,000			654,500 (1)				16,363,000		
1951			1,011,000	654,500	356,500	356,500		16,363,000		
1952	4,000,000		1,221,000	814,500	406,500	763,000		20,363,000		
1953	4,000,000		1,441,000	974,500	466,500	1,239,300		24,363,000		
1954			1,502,000	974,000	328,000	1,567,000		24,363,000		
1955			1,572,000	974,000	598,000	2,165,500		24,363,000		
1956			1,019,000	974,000	845,000	3,010,000		24,363,000		
1957	3,000,000		2,040,000	1,094,500	945,500	3,955,500	1,998,600	27,363,000	4%	79,900
1958		555,000	2,293,000	1,014,600	1,278,400	1,877,000	1,229,200	25,364,400	4%	49,200
1959		657,000	2,477,000	965,400	1,511,600	1,877,000	1,453,500	24,135,200	4%	58,100
1960		760,000	2,656,000	907,300	1,748,700	1,877,00	1,681,400	22,681,700	4%	67,300
1961		860,000	2,817,000	840,000	1,977,000	1,877,000	1,901,000	21,000,300	4%	76,000
1962		949,000	2,925,000	764,000	2,161,000	1,877,000	2,098,100	19,099,300	3%	62,900
1963		1,029,000	3,024,000	680,000	2,344,000	1,877,000	2,275,700	17,001,200	3%	60,300
1964		1,098,000	3,086,000	589,000	2,497,000	1,877,000	2,424,300	14,725,500	3%	72,700
1965		1,152,000	3,117,000	492,000	2,625,000	1,877,000	2,548,500	12,301,200	3%	76,500
1966		1,224,000	3,183,000	390,100	2,792,900	1,877,000	2,711,600	9,752,700	3%	81,300
1967		1,343,000	3,216,000	281,600	3,034,400	1,877, 00	2,974,900	7,041,100	2%	59,500
1968		1,370,000	3,253,000	162,600	3,090,400	1,877,000	3,029,800	4,066,200	2%	60,600
1969		1,440,000	3,273,000	41,500	3,231,500	1,877,000	1,036,400	1,036,400	2%	20,700
1970		1,510,000	3,286,000			(2)		-0-		
1971		1,605,000	3,302,000							
1972		1,700,000	3,321,000							
1973		1,795,000	3,325,000							
1974		1,890,000	3,334,000							
1975		2,010,000	3,337,000							
1976		2,130,000	3,344,000							
1977		2,286,000	3,348,000							
		$27,363,000 (1)								

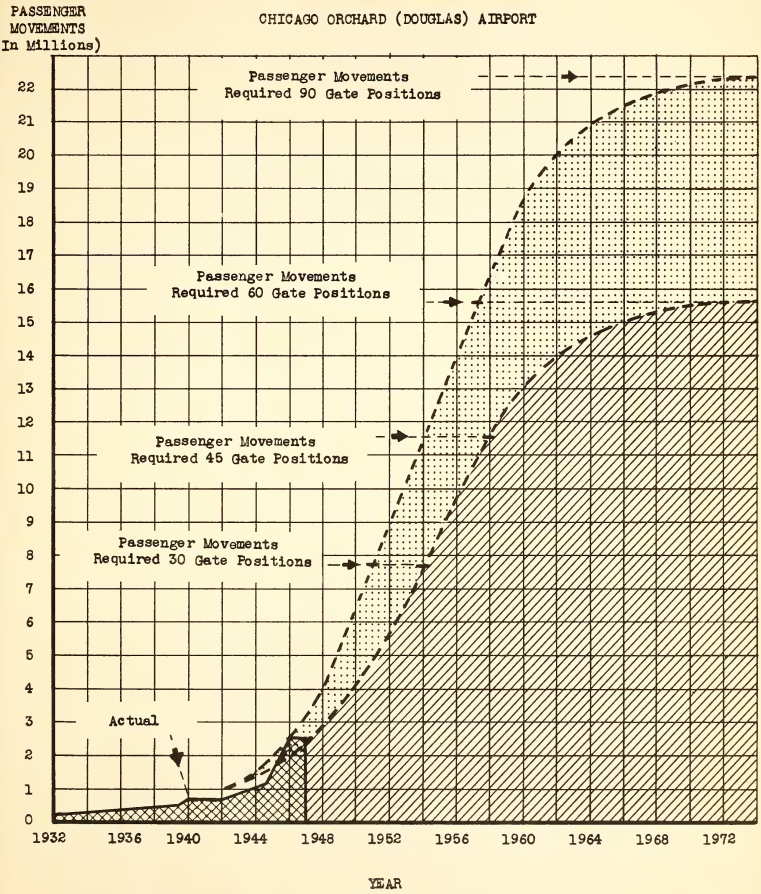
(1) Interest Payable 1948 to 1950, inclusive to be paid out of Bond proceeds, therefore, an additional $1,363,000 must be raised to meet the interest payments.

(2) Keep minimum of $1,877,000 at all times as a Debt Service Reserve to be built up in early years.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

PEARL BIO-METRIC CURVE SHOWING PASSENGER ARRIVALS AND DEPARTURES

CHICAGO ORCHARD (DOUGLAS) AIRPORT



STATISTICAL:EJB:im - 2/2/48

REPORT 100
(A)

ESTIMATED YEARLY AIR PASSENGERS AT CHICAGO ORCHARD (DOUGLAS) AIRPORT
ARRIVALS PLUS DEPARTURES

	PASSENGER MOVEMENTS	
YEAR	Conservative Estimate	Possible Totals
1951	4,960,000	7,100,000
1952	5,800,000	8,300,000
1953	6,750,000	9,670,000
1954	7,840,000	11,200,000
1955	8,900,000	12,730,000
1956	9,850,000	14,100,000
1957	10,700,000	15,300,000
1958	11,500,000	16,450,000
1959	12,210,000	17,500,000
1960	12,900,000	18,480,000
1961	13,520,000	19,380,000
1962	13,950,000	19,980,000
1963	14,350,000	20,550,000
1964	14,600,000	20,890,000
1965	14,700,000	21,200,000
1966	15,100,000	21,455,000
1967	15,130,000	21,671,000
1968	15,280,000	21,850,000
1969	15,380,000	21,980,000
1970	15,420,000	22,091,000
ULTIMATE	15,650,000	22,400,000

The two curves represent possible developments in air passenger movements at Chicago. They are based on a study of air traffic and follow a Pearl bio-metric type of forecast projected from 1932 to 1947 and on thru 1970. The lower or conservative curve shows air passenger growth with no outside factors to assist its normal increase and with allowances made for elements which may retard its normal increase. The upper or longer curve allows full development of the passenger growth in a normal progression as technical knowledge and allied factors parallel the air passenger growth. Construction based on the conservative curve can be increased at any point to meet the greater growth if required.

RESEARCH:EJB:lml - 2/10/48

REPORT 100
(A)

APPARENT PIPE RESISTIVITIES

INDUCTION LOG (IL)

YEAR	Observatory Estimate	Favorable Y Data
1951	4,240,000	1,180,000
1952	3,860,000	4,340,000
1953	6,120,000	4,010,000
1954	7,890,000	17,890,000
1955	8,040,000	12,750,000
1956	4,580,000	14,100,000
1957	14,210,000	11,320,000
1958	11,860,000	10,240,000
1959	12,030,000	12,310,000
1960	10,200,000	10,850,000
1961	11,350,000	09,420,000
1962	12,080,000	10,180,000
1963	14,720,000	07,090,000
1964	13,040,000	06,870,000
1965	12,100,000	07,000,000
1966	12,730,000	07,430,000
1967	15,880,000	01,870,000
1968	17,000,000	03,960,000
1969	10,840,000	05,021,000
ESTIMATE	13,040,000	09,180,000

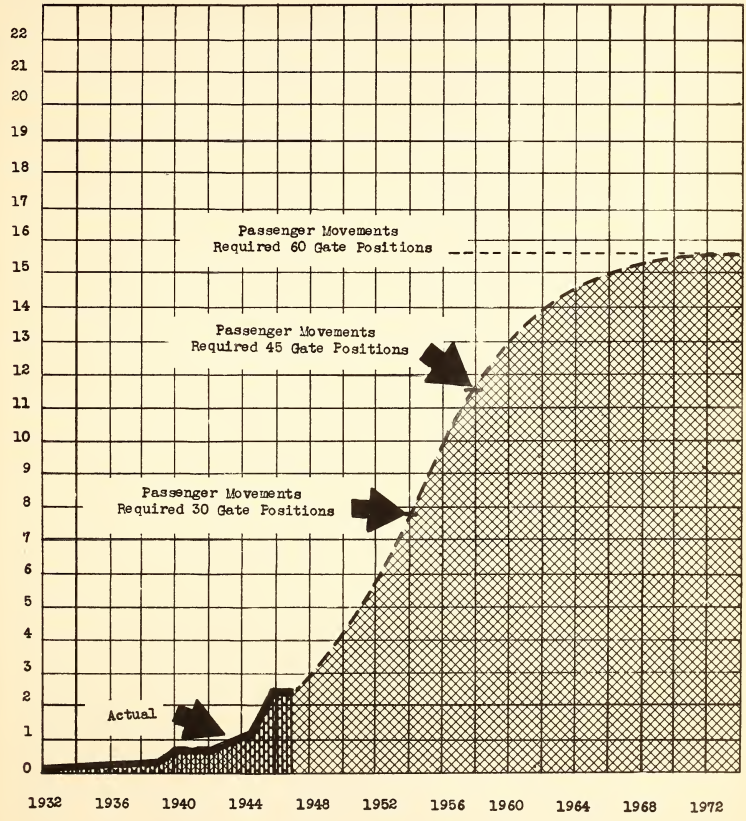
The two curves represent possible interpretation in air resource reservoir at Chinook. They are fixed on a study of air traffic and traffic beside a fault block-style of formation penetrated from 1950 to 1967 and on time 1970. The lower or conservative curve shows air resource growth with no outside factors to model its actual increase and risk alternative used for planning when one assumes the normal increase. The other curve represents optimum use of the resource knowledge or lesser use as actual development of the resource would be a normal progression or movement transferred and actual returns performed. It is only due to increased or any delay in most the growth it might have.

NUMERICAL:ATR.jnd - 4/19/70 REVISED 1/70

PEARL BIO-METRIC CURVE SHOWING PASSENGER ARRIVALS AND DEPARTURES

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CONSERVATIVE PLAN



STATISTICAL:EJB:im - 2/2/48

REPORT 100
(A)

ACTUAL AND POTENTIAL ARRIVALS PLUS DEPARTURES OF AIR PASSENGERS AT CHICAGO, 1932-1973

YEAR	ANNUAL PASSENGER VOLUME	YEAR	ANNUAL PASSENGER VOLUME
1932	92,112	1953	9,670,000
1933	117,593	1954	11,200,000
1934	125,944	1955	12,730,000
1935	176,246	1956	14,100,000
1936	240,677	1957	15,300,000
1937	262,590	1958	16,450,000
1938	307,860	1959	17,500,000
1939	408,893	1960	18,480,000
1940	621,524	1961	19,380,000
1941	727,618	1962	19,980,000
1942	633,656	1963	20,550,000
1943	679,083	1964	20,890,000
1944	915,645	1965	21,200,000
1945	1,319,115	1966	21,455,000
1946	2,488,191	1967	21,671,000
1947	3,220,000*	1968	21,850,000
1948	3,920,000	1969	21,980,000
1949	4,900,000	1970	22,091,000
1950	5,950,000	1971	22,182,000
1951	7,100,000	1972	22,255,000
1952	8,300,000	1973	22,300,000

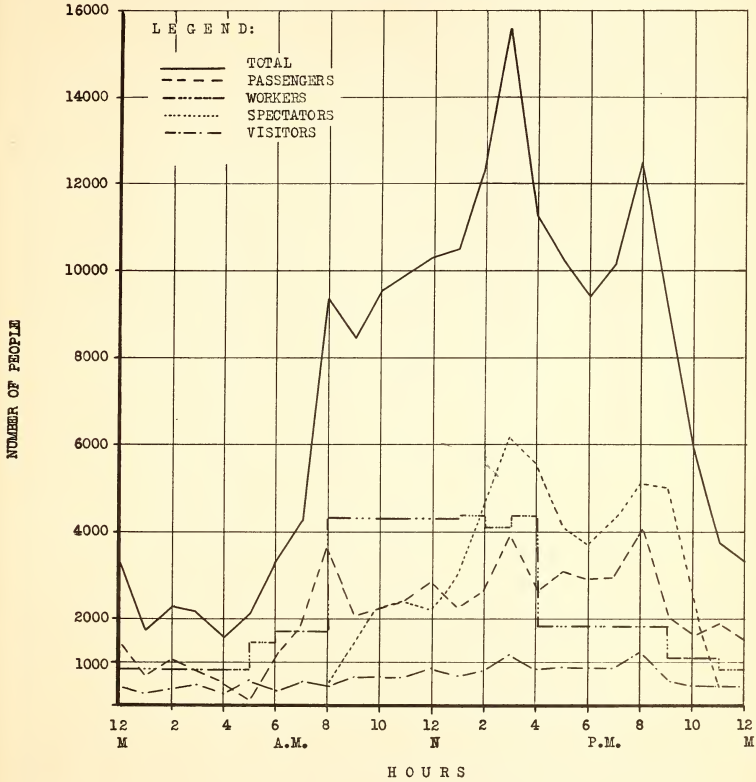
*Potential volumes are based upon a Pearl biometric type of curve (as calculated by W Watters Pegon and published in Proceedings, American Society of Civil Engineers, Feb. 1941) fitted to the 1938, 1941 and 1946 volumes, which were assumed to be fairly representative of the trend of growth. This curve indicates that the increment of growth will gradually increase until about 1954, when it will begin to taper off until about 1970 when the yearly number of air passengers arriving plus departing at Chicago will approach a saturation point of 22.4 millions.

ACTUAL AND POTENTIAL ARRIVALS PLUS INTERVENING OR ALL PASSENGERS
AT CHICAGO, 1932-1971

YEAR	ANNUAL PASSENGER VOLUME	TIME	ANNUAL PASSENGER VOLUME
1932	88,119	1972	3,890,000
1933	141,324	1973	17,800,000
1934	167,384	1974	16,750,000
1935	176,346	1975	14,100,000
1936	890,077	1976	15,300,000
1937	886,700	1977	12,800,000
1938	701,060	1978	11,050,000
1939	806,089	1979	10,150,000
1940	673,758	1980	10,300,000
1941	741,410	1981	10,640,000
1942	633,704	1982	10,340,000
1943	579,193	1983	10,290,000
1944	913,643	1984	11,000,000
1945	1,329,115	1985	11,840,000
1946	2,149,120	1986	12,810,000
1947	2,660,000	1987	13,850,000
1948	2,850,000	1988	14,980,000
1949	2,800,000	1989	16,210,000
1950	3,290,000	1990	17,540,000
1951	3,100,000	1991	18,980,000
1952	3,340,000	1992	20,540,000

Figures in the 1932-1951 and 1952-present columns, which were prepared by the Traffic Research Corporation, Washington, District of Columbia, are based upon a hypothetical type of curve (as explained in the text) which is assumed to be typical of growth. This curve indicates that the increases in growth will gradually increase until about 1990, when it will begin to taper off until about 1970 when the yearly number of passengers arriving from departing at Chicago will approach a saturation point of 2.4 millions.

NUMBER OF PEOPLE IN TERMINAL AREA
VS
HOURS OF THE DAY FOR THE PEAK HOUR - PEAK DAY - PEAK MONTH
ULTIMATE YEAR
CONSERVATIVE PLAN



STATISTICAL:EJB:lml-2/5/48

REPORT 100
(A)

CHICAGO ORCHARD (DOUGLAS) AIRPORT

NUMBER OF PEOPLE IN TERMINAL AREA AT ONE TIME

CONSERVATIVE PLAN

HOUR	PASSENGERS	VISITORS	WORKERS	SPECTATORS	TOTAL
12 M - 1:00 A.M.	1580	520	840	455	3395
1:00 - 2:00	726	210	840	0	1776
2:00 - 3:00	1090	329	840	0	2259
3:00 - 4:00	830	476	840	0	2146
4:00 - 5:00	524	197	840	0	1561
5:00 - 6:00	183	520	1440	0	2143
6:00 - 7:00	1190	390	1760	0	3340
7:00 - 8:00	1870	584	1760	0	4214
8:00 - 9:00	3620	1060	4340	470	9490
9:00 - 10:00	2080	628	4340	1420	8465
10:00 - 11:00	2240	628	4340	2320	9528
11:00 - 12:00	2430	740	4340	2410	9920
12 N - 1:00 P.M.	2880	890	4340	2227	10337
1:00 - 2:00	2320	730	4400	3050	10500
2:00 - 3:00	2720	830	4100	4720	12370
3:00 - 4:00	3960	1200	4400	6200	15760
4:00 - 5:00	2760	870	1850	5600	11080
5:00 - 6:00	3180	990	1850	4200	10230
6:00 - 7:00	2940	920	1850	3760	9470
7:00 - 8:00	3060	956	1850	4400	10265
8:00 - 9:00	4180	1310	1850	5150	12490
9:00 - 10:00	2140	715	1180	5050	9085
10:00 - 11:00	1650	520	1180	2560	5910
11:00 - 12:00	1920	595	840	455	3810

During the peak day of the conservative design, the number of people present in the airport during the day is shown by hours.

STATISTICAL

REPORT 100
(A)

EJB/im
2/3/48

CONSIDERABLE LIKE

OPINION OF LIBERTY TO ELECTRIC PLAN OF NOR LIKE

CHEESE EXCEPT (MEDIUM) THROUGH

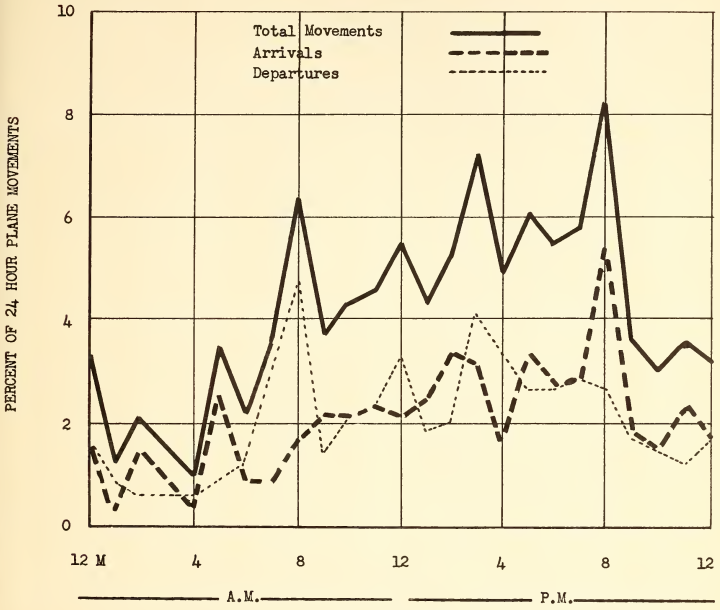
HOUSE	EXPERIMENT	FUNCTION	NUMBER	RESPONSIBLE	LOSING
12 W - 1:00 A.M.	1260	280	840	452	7360
1:00 - 2:00	1470	320	940	0	1110
2:00 - 3:00	1580	340	940	0	1260
3:00 - 4:00	830	240	940	0	1280
4:00 - 5:00	340	120	940	0	1420
5:00 - 6:00	740	240	1180	0	1580
6:00 - 7:00	1240	380	1460	0	1980
7:00 - 8:00	2340	680	1620	0	2030
8:00 - 9:00	3050	1000	1980	0	2430
9:00 - 10:00	3980	1280	2380	1480	2860
10:00 - 11:00	5020	1580	2780	2720	3080
11:00 - 12:00	5840	1840	3180	3010	3280
12 N - 1:00 P.M.	6980	2080	3540	3520	3432
1:00 - 2:00	7780	2280	3820	3820	3580
2:00 - 3:00	8480	2480	4080	4020	3780
3:00 - 4:00	9020	2680	4280	4220	3980
4:00 - 5:00	9480	2880	4480	4420	4180
5:00 - 6:00	9780	3080	4680	4620	4380
6:00 - 7:00	9980	3280	4880	4820	4580
7:00 - 8:00	10020	3480	5080	5020	4780
8:00 - 9:00	9980	3680	5280	5220	4980
9:00 - 10:00	9780	3880	5480	5420	5180
10:00 - 11:00	9480	4080	5680	5620	5380
11:00 - 12:00	9020	4280	5880	5820	5580
12 M - 1:00 P.M.	8480	4480	6080	6020	5780
1:00 - 2:00	7780	4680	6280	6220	5980
2:00 - 3:00	6980	4880	6480	6420	6180
3:00 - 4:00	5840	5080	6680	6620	6380
4:00 - 5:00	5020	5280	6880	6820	6580
5:00 - 6:00	4080	5480	7080	7020	6780
6:00 - 7:00	3280	5680	7280	7220	6980
7:00 - 8:00	2480	5880	7480	7420	7180
8:00 - 9:00	1680	6080	7680	7620	7380
9:00 - 10:00	880	6280	7880	7820	7580
10:00 - 11:00	280	6480	8080	8020	7780
11:00 - 12:00	80	6680	8280	8220	7980

Because of the reduced charges for gas to users at night,

Despite its local gift of the constructive quality, the weather of Jacoby

PLANE MOVEMENTS DURING A 24 HOUR
PEAK DAY SHOWN IN HOURLY PERCENTAGES

CHICAGO ORCHARD (DOUGLAS) AIRPORT



This chart shows how the airplane arrivals and departures are distributed over a twenty-four hour period. It was calculated on the peak hour, peak day traffic movements. It will be noted that the maximum plane arrivals and departures do not occur at the same time, causing an accumulation of planes to be parked.

STATISTICAL:EJB:lml - 2/3/48

REPORT 100
(A)

CHICAGO ORCHARD (DOUGLAS) AIRPORT

PLANE MOVEMENTS DURING A 24-HOUR
PEAK DAY IN HOURLY PERCENTAGES

HOUR	Total Movements % of 24 hr. Total	Arrivals % of 24 Hr. Total	Departures % of 24 Hr. Total
12 M - 1:00 A.M	3.03%	1.515	1.515
1:00 - 2:00	1.21%	0.303	0.909
2:00 - 3:00	2.12%	1.515	0.606
3:00 - 4:00	1.51%	1.212	0.303
4:00 - 5:00	0.909	0.303	0.606
5:00 - 6:00	3.636	2.728	0.909
6:00 - 7:00	2.12	0.909	1.212
7:00 - 8:00	3.636	0.909	2.727
8:00 - 9:00	6.66	1.515	5.152
9:00 - 10:00	3.636	2.121	1.515
10:00 - 11:00	4.242	2.121	2.121
11:00 - 12:00	4.24	2.121	2.121
12 N - 1:00 P.M.	5.454	2.121	3.333
1:00 - 2:00	4.242	2.424	1.818
2:00 - 3:00	5.152	3.333	1.818
3:00 - 4:00	7.56	3.030	4.545
4:00 - 5:00	4.848	1.515	3.333
5:00 - 6:00	6.06	3.334	2.728
6:00 - 7:00	5.454	2.728	2.728
7:00 - 8:00	5.76	3.031	2.728
8:00 - 9:00	8.181	5.456	2.728
9:00 - 10:00	3.636	1.818	1.818
10:00 - 11:00	3.03	1.515	1.515
11:00 - 12 M	3.636	2.424	1.212

CENTRAL STANDARD TIME

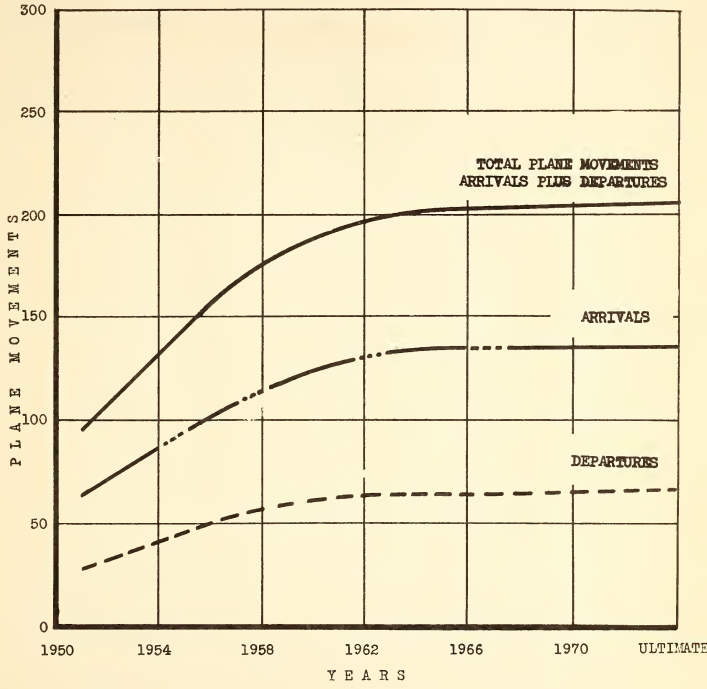
STATISTICAL:EJB:im-2/3/48

REPORT 100
(A)

FINAL MOVEMENTS DURING A 24-HOUR
ONE DAY IN MONTH'S PROCEEDINGS

Hour	Total Movements # of M. for Total	Arrivals # of M. to Mr. Total	Departures # of M. to Mr. Total
12 M - 1:00 A.M.	1,038	1,012	1,014
1:00 - 2:00	1,218	0,863	0,869
2:00 - 3:00	0,722	1,014	0,708
3:00 - 4:00	1,02	0,811	0,803
4:00 - 5:00	0,803	0,826	0,826
5:00 - 6:00	0,830	0,780	0,760
6:00 - 7:00	0,72	0,804	1,004
7:00 - 8:00	0,898	0,898	0,747
8:00 - 9:00	0,66	1,017	1,032
9:00 - 10:00	0,960	0 111	1,023
10:00 - 11:00	0,960	0,741	0,780
11:00 - 12:00	0,96	0,722	0,780
12 M - 1:00 P.M.	0,960	0,722	0,923
1:00 - 2:00	0,960	0,804	1,020
2:00 - 3:00	0,720	0,722	1,020
3:00 - 4:00	1,04	0,960	0,960
4:00 - 5:00	0,96	0,722	0,923
5:00 - 6:00	0,96	0,722	0,758
6:00 - 7:00	0,804	0,720	0,758
7:00 - 8:00	0,72	0,722	0,758
8:00 - 9:00	0,803	0,696	0,758
9:00 - 10:00	0,720	0,911	0,804
10:00 - 11:00	0,6	0,722	0,72
11:00 - 12 M	0,690	0,804	0,720

CONSERVATIVE PLAN
PLANE MOVEMENTS DURING PEAK HOUR - PEAK DAY - PEAK MONTH OF EACH YEAR
CHICAGO ORCHARD (DOUGLAS) AIRPORT



STATISTICAL:EJB:lml - 2/3/48

REPORT 100
(A)

CHICAGO ORCHARD (DOUGLAS) AIRPORT

PEAK HOUR PLANE MOVEMENTS FOR PEAK MONTH - 8:00 P.M. - 9:00 P.M.

CONSERVATIVE PLAN

YEAR	ARRIVALS	DEPARTURES	TOTAL
1951	64	32	96
1952	71	35	106
1953	77	38	115
1954	88	43	131
1955	96	48	144
1956	104	51	165
1957	110	54	164
1958	115	57	172
1959	121	59	180
1960	125	61	186
1961	129	64	193
1962	132	65	197
1963	134	66	200
1964	135	66	201
1965	135	67	202
1966	136	67	203
1967	137	67	204
1968	137	68	205
1969	137	68	205
1970	137	68	205
Ultimate	138	67	205

This table shows the maximum number of plane movements for the concervative estimate. It occurs during the hours of 8:00 to 9:00 P.M. when the total arrivals reaches 137 plane movements and departures total 68 movements.

STATISTICAL

REPORT 100
(A)

EJB:im - 2/3/48

DEPARTURE

RETURN 1DO
(1)

any temperature below 60 recorded.

5/10 D/W when the first multiple exceeds 7.5 times preceding consecutive multiples. It counts double for those of 9/10 or more inside minus the maximum number of times exceeded for the

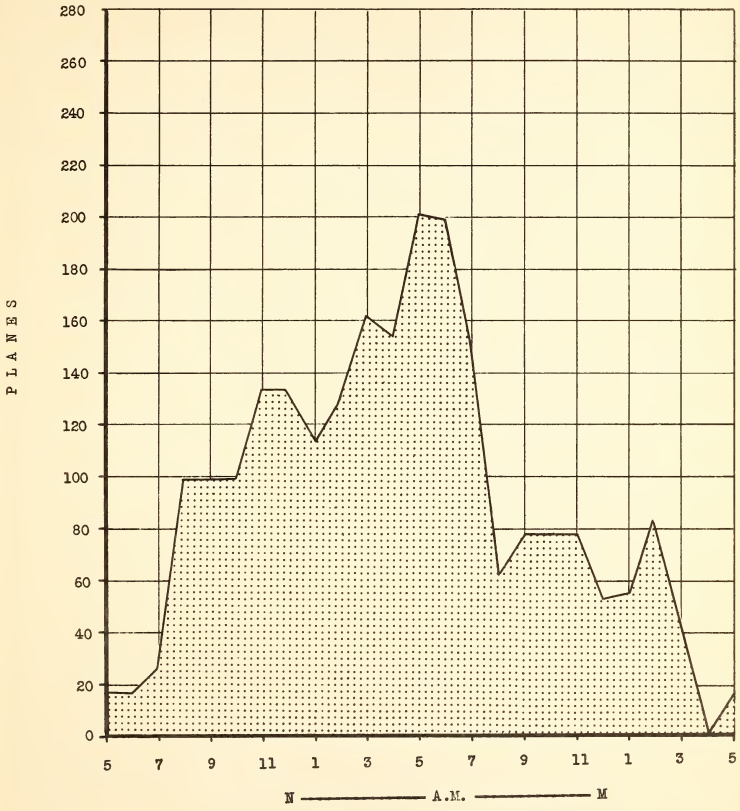
Distance	130	81	665
1951	131	82	665
1950	132	82	665
1949	133	83	665
1948	134	84	665
1947	135	84	665
1946	136	85	665
1945	137	85	665
1944	138	86	665
1943	139	87	665
1942	140	87	665
1941	141	88	665
1940	142	89	665
1939	143	89	665

NUMBER OF PLANES ACCUMULATED AT CHICAGO ORCHARD (DOUGLAS) AIRPORT

-vs-

HOURS OF THE DAY FOR THE PEAK DAY - PEAK MONTH OF ULTIMATE YEAR

CONSERVATIVE PLAN



STATISTICAL:EJB:lml - 2/5/48

REPORT 100
(A)

HOURLY DISTRIBUTION OF PLANE MOVEMENTS

CHICAGO ORCHARD (DOUGLAS) AIRPORT

CONSERVATIVE PLAN

HOUR	ARRIVALS	DEPARTURES	TOTAL	ACCUMULATION
5:00 - 6:00 P.M	83	66	149	17
6:00 - 7:00	68	68	136	17
7:00 - 8:00	75	64	139	28
8:00 - 9:00	138	67	205	99
9:00 - 10:00	46	46	92	99
10:00 - 11:00	38	38	76	99
11:00 - 12:00	62	28	90	133
12 M - 1:00 A.M.	38	38	76	133
1:00 - 2:00	7	26	33	114
2:00 - 3:00	38	13	51	139
3:00 - 4:00	30	7	37	162
4:00 - 5:00	7	15	22	154
5:00 - 6:00	68	21	89	201
6:00 - 7:00	23	29	52	195
7:00 - 8:00	22	66	88	151
8:00 - 9:00	38	126	164	63
9:00 - 10:00	53	38	91	78
10:00 - 11:00	53	53	106	78
11:00 - 12:00	53	53	106	78
12 N - 1:00	53	80	133	51
1:00 - 2:00	54	52	106	53
2:00 - 3:00	83	50	133	86
3:00 - 4:00	73	116	189	43
4:00 - 5:00	38	81	119	0

The arrival and departure peaks occuring at different hours results in an accumulation of planes requiring parking.

EJB/im

2/2/48

DOMESTIC LIFE

CLERICAL (SCRIBAL) WORK

CLERICAL MISAPPLICATION OF LETTER MONOGRAMS

HOUR	MISCARRIED	INDEPENDENCE	SCOLD	PROCRASTINATION
5:00 - 6:00 A.M.	43	90	191	11
6:00 - 7:00	65	48	178	14
7:00 - 8:00	13	68	139	89
8:00 - 9:00	14	64	201	59
9:00 - 10:00	14	84	96	59
10:00 - 11:00	34	34	16	59
11:00 - 12:00	94	84	69	171
12 M - 1:00 P.M.	31	34	16	131
1:00 - 2:00	1	24	33	111
2:00 - 3:00	34	13	31	139
3:00 - 4:00	34	1	31	149
4:00 - 5:00	1	12	54	144
5:00 - 6:00	19	34	40	91
6:00 - 7:00	43	54	34	134
7:00 - 8:00	34	84	49	104
8:00 - 9:00	34	149	49	134
9:00 - 10:00	34	34	34	14
10:00 - 11:00	24	34	144	14
11:00 - 12:00	24	24	144	14
TOTAL	34	94	134	34
1:00 - 2:00	44	114	134	34
2:00 - 3:00	44	114	134	34
3:00 - 4:00	34	84	134	34
4:00 - 5:00	34	84	134	34
5:00 - 6:00	34	84	134	34
6:00 - 7:00	34	84	134	34
7:00 - 8:00	34	84	134	34
8:00 - 9:00	34	84	134	34
9:00 - 10:00	34	84	134	34
10:00 - 11:00	34	84	134	34
11:00 - 12:00	34	84	134	34
TOTAL	34	84	134	34

The solvent and dissolute people concerned in disclosed house wrecks

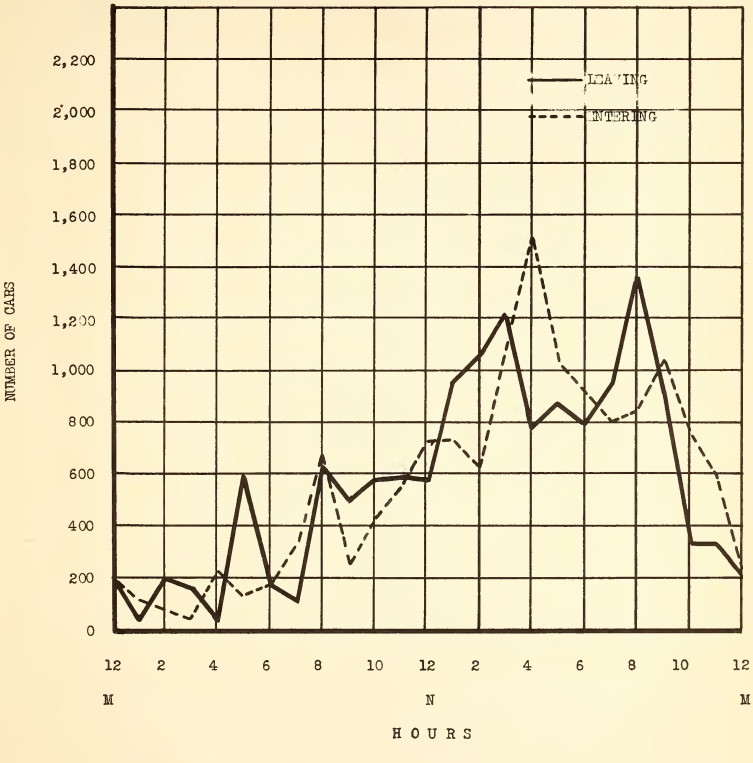
to an accompanyin of fierce combustible lectures.

5\6\48

2\3\48

HOURLY NUMBER OF CARS ENTERING AND LEAVING PARKING LOTS OF
CHICAGO ORCHARD (DOUGLAS) AIRPORT DURING PEAK DAY OF PEAK MONTH ULTIMATE YEAR

CONSERVATIVE PLAN



RESEARCH:JLD:lml - 2/19/48

REPORT 100
(A)

NUMBER OF PASSENGER CARS ENTERING, DEPARTING AND ACCUMULATING IN THE PARKING AREA OF THE CHICAGO ORCHARD (DOUGLAS) AIRPORT
PEAK DAY, PEAK MONTH, ULTIMATE YEAR

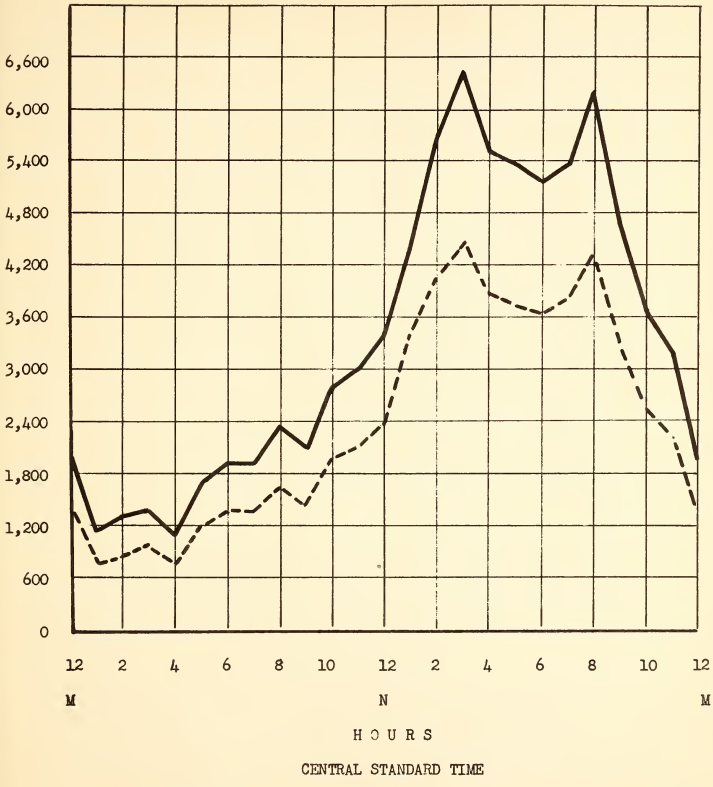
CONSERVATIVE PLAN

HOUR	ENTERING	LEAVING	ACCUMULATING
12 M - 1:00 A.M.	202	202	81
1:00 - 2:00	40	121	0
2:00 - 3:00	202	31	121
3:00 - 4:00	161	41	241
4:00 - 5:00	40	227	54
5:00 - 6:00	687	121	620
6:00 - 7:00	172	161	631
7:00 - 8:00	117	373	275
8:00 - 9:00	630	683	222
9:00 - 10:00	494	246	470
10:00 - 11:00	579	423	626
11:00 - 12 N	581	547	660
12 N - 1:00	678	723	615
1:00 - 2:00	956	728	743
2:00 - 3:00	1059	621	1181
3:00 - 4:00	1211	1108	1284
4:00 - 5:00	779	1518	545
5:00 - 6:00	876	1041	380
6:00 - 7:00	795	925	250
7:00 - 8:00	951	803	398
8:00 - 9:00	1354	847	905
9:00 - 10:00	919	1041	783
10:00 - 11:00	336	771	343
11:00 - 12:00	329	596	81
	13948	13948	

EJB:im 2/20/48

NUMBER OF CARS PARKED AT ONE TIME AT CHICAGO ORCHARD (DOUGLAS) AIRPORT

PEAK DAY - PEAK MONTH



CENTRAL STANDARD TIME

RESEARCH:EJB:lml - 2/20/48

REPORT 100
(A)

NUMBER OF CARS IN THE PARKING LOT AT ONE TIME OF THE CHICAGO ORCHARD (DOUGLAS) AIRPORT FOR PEAK DAY - PEAK MONTH

HOUR	TOTALS POSSIBLE	CONSERVATIVE
12 M - 1:00 A.M.	2010	1400
1:00 - 2:00	1165	820
2:00 - 3:00	1280	880
3:00 - 4:00	1370	970
4:00 - 5:00	1130	780
5:00 - 6:00	1715	1200
6:00 - 7:00	1920	1340
7:00 - 8:00	1920	1340
8:00 - 9:00	2360	1650
9:00 - 10:00	2095	1470
10:00 - 11:00	2785	1950
11:00 - 12:00	3000	2100
12 N - 1:00	3360	2360
1:00 - 2:00	4445	3120
2:00 - 3:00	5720	4000
3:00 - 4:00	6445	4510
4:00 - 5:00	5525	3880
5:00 - 6:00	5355	3750
6:00 - 7:00	5155	3620
7:00 - 8:00	5365	3760
8:00 - 9:00	6195	4350
9:00 - 10:00	4700	3300
10:00 - 11:00	3695	2590
11:00 - 12:00	3125	2190

The number of cars using the parking lots and requiring facilities are shown for both a conservative and ultimate possible plan.

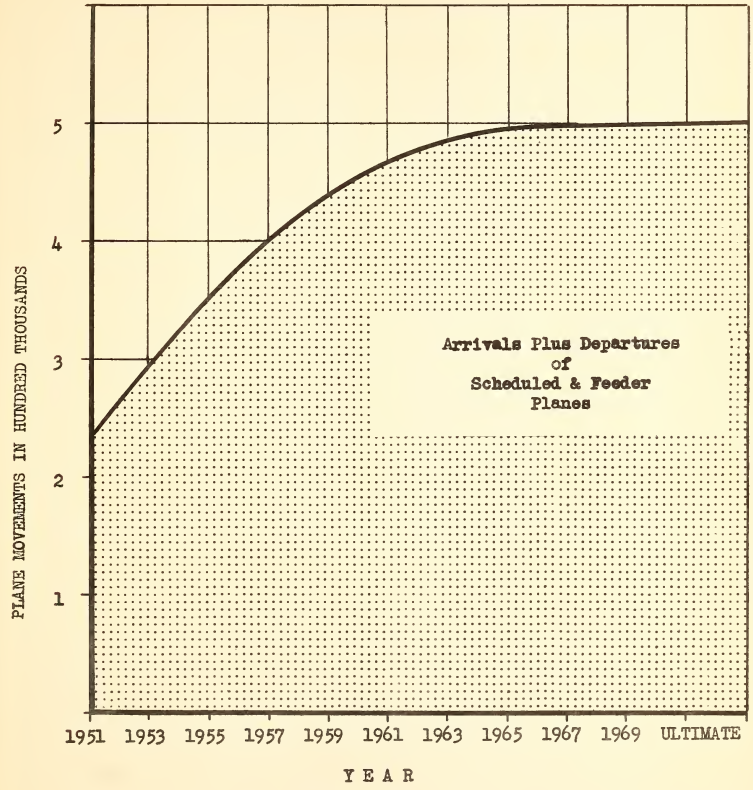
EJB - 2/28/48

there was sharp for both a powerpoints an ultimate inquiry.
the nature of case noted the teacher told was individual small.

11:00 - 12:00	1540	1700
10:00 - 11:00	7000	1400
9:00 - 10:00	1A0C	1300
8:00 - 9:00	0700	1A0
7:00 - 8:00	0340	1400
6:00 - 7:00	2A20	1300
5:00 - 6:00	3220	1400
4:00 - 5:00	32C0	3A00
3:00 - 4:00	3A00	1A00
2:00 - 3:00	3A00	1A00
1:00 - 2:00	3A00	1A00
12:00 - 1:00	3A00	1A00
11:00 - 12:00	3A00	1A00
10:00 - 11:00	8A00	1A00
9:00 - 10:00	8A00	1A00
8:00 - 9:00	E3C0	1500
7:00 - 8:00	1C00	1A00
6:00 - 7:00	4500	1A00
5:00 - 6:00	7A70	1A00
4:00 - 5:00	1C00	1A00
3:00 - 4:00	1C00	1A00
2:00 - 3:00	1C00	1A00
1:00 - 2:00	1C00	1A00
12:00 - 1:00	1C00	1A00
11:00 - 12:00	1C00	1A00
10:00 - 11:00	1C00	1A00
9:00 - 10:00	1C00	1A00
8:00 - 9:00	1C00	1A00
7:00 - 8:00	1C00	1A00
6:00 - 7:00	1C00	1A00
5:00 - 6:00	1C00

CONSERVATIVE PLAN

NUMBER OF PLANE MOVEMENTS
BY YEARS EXPECTED AT
CHICAGO ORCHARD (DOUGLAS) AIRPORT



STATISTICAL:EJB:lml - 2/5/48

REPORT 100
(A)

ESTIMATED MINIMUM YEARLY NUMBER OF POTENTIAL AIRPLANE MOVEMENTS AT THE CHICAGO ORCHARD AIRPORT

CONSERVATIVE PLAN

YEAR	ARRIVALS PLUS DEPARTURES OF FEEDER PLANES	ARRIVALS PLUS DEPARTURES OF SCHEDULED AIRLINERS	TOTAL PLANE MOVEMENTS	PEAK HOUR TOTAL ARRIV.	DEPART.	TOTAL
1951	63,350	170,150	233,500	64	32	96
1952	65,100	194,600	259,700	71	35	106
1953	67,200	281,900	289,100	77	38	115
1954	69,300	251,300	320,600	88	43	131
1955	72,100	280,000	382,100	96	48	144
1956	74,200	304,500	378,700	104	51	155
1957	77,700	322,700	400,400	110	54	164
1958	80,500	340,900	421,400	115	57	172
1959	83,300	354,900	438,200	121	59	180
1960	86,000	368,800	454,800	125	61	186
1961	91,000	379,000	470,900	129	64	193
1962	93,500	386,500	480,000	132	65	197
1963	96,400	391,900	488,300	134	66	200
1964	98,000	392,600	490,600	135	66	201
1965	99,400	394,000	493,400	135	67	202
1966	100,500	395,100	495,600	136	67	203
1967	101,500	395,600	497,000	137	67	204
1968	102,400	396,500	498,900	137	68	205
1969	103,000	396,700	499,700	137	68	205
1970	103,500	396,900	500,400	137	68	205
ULTIMATE	104,500	397,500	502,000	138	67	205

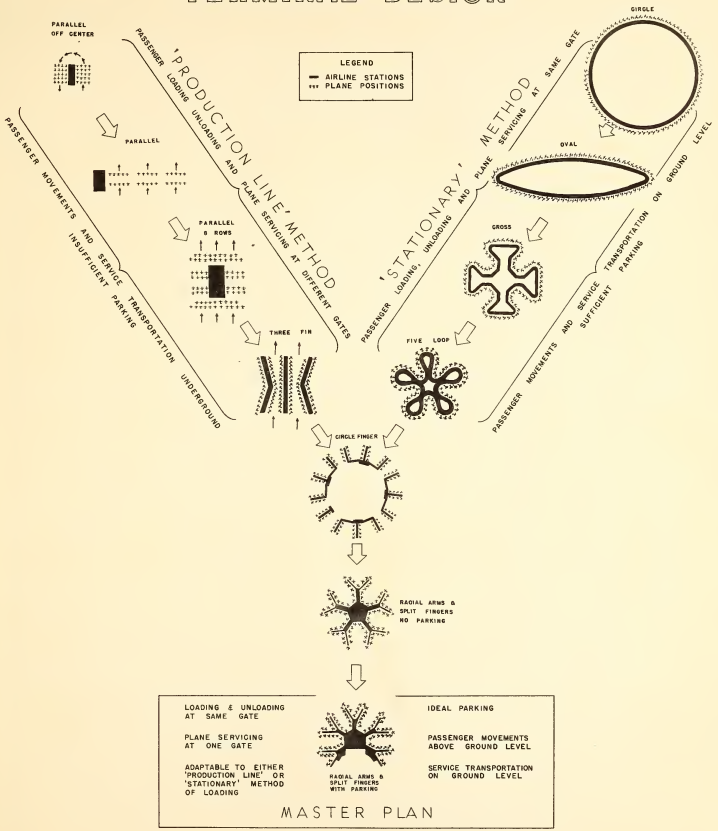
STATISTICAL
EJB/im
2/5/48

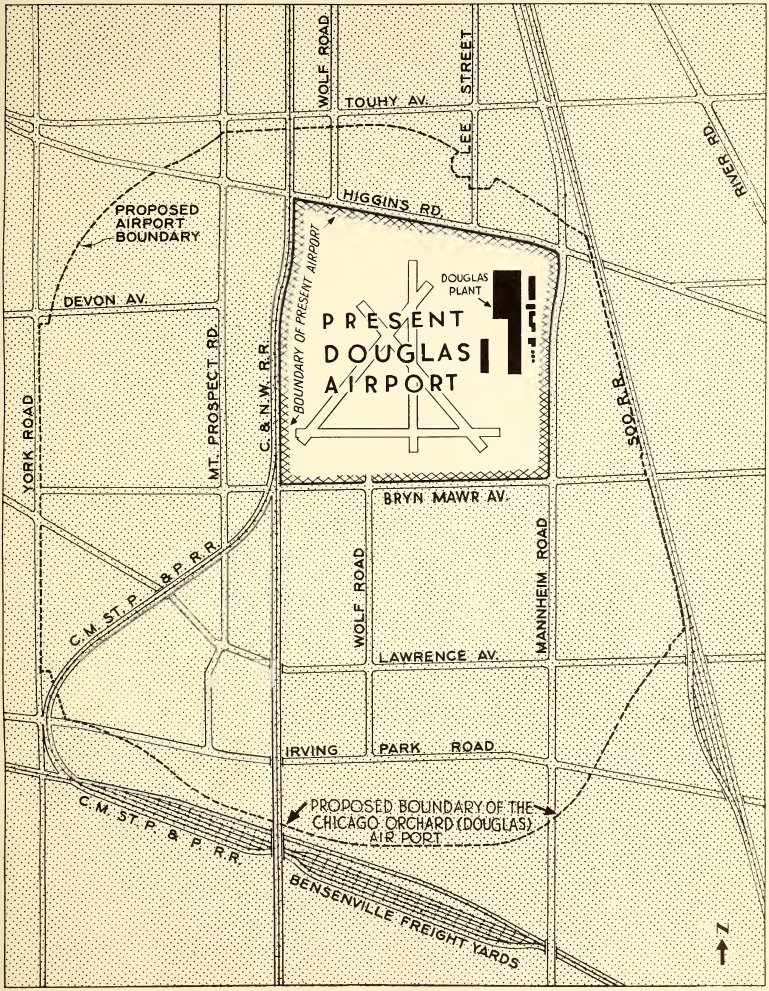
REPORT 100
(A)

CUADRO GENERAL COMPARADO

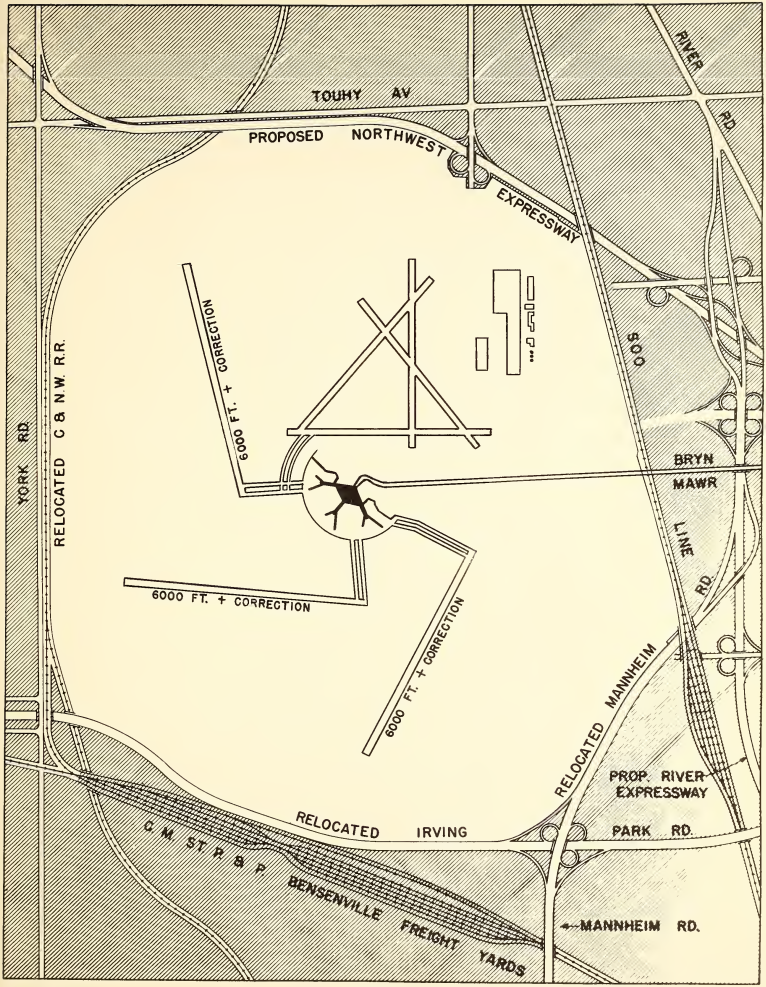
AÑOS	CAPITAL NACIONAL	DEPOSITOS EXIGIBLES	DEPOSITOS DE AHORRO	CAPITAL Y RESERVAS	UTILIDADES	RAZON ENTRE CAPITAL Y DEPOSITOS
1941	93,340	131,520	42,340,340	6%	6%	8%
1942	93,780	134,980	45,340,100	17%	6%	14%
1943	94,800	135,660	386,340,100	14%	3%	13%
1944	96,340	321,800	320,600,000	34%	4%	12%
1945	17,600	200,000	340,100,000	20%	1%	14%
1946	41,000	56,900	316,900,000	7%	2%	12%
1947	11,000	320,300	400,600,000	11%	3%	15%
1948	98,000	324,000	421,800,000	12%	2%	14%
1949	97,800	324,000	9,800,000	12%	2%	14%
1950	98,800	326,000	434,900,000	12%	2%	14%
1951	9,000	313,000	439,000,000	12%	2%	13%
1952	98,000	320,300	440,000,000	12%	2%	13%
1953	98,340	324,000	440,600,000	12%	2%	13%
1954	98,800	326,000	440,900,000	12%	2%	13%
1955	9,000	313,000	439,000,000	12%	2%	13%
1956	98,000	320,300	440,000,000	12%	2%	13%
1957	98,340	324,000	440,600,000	12%	2%	13%
1958	98,800	326,000	440,900,000	12%	2%	13%
1959	103,000	327,000	441,000,000	12%	2%	13%
1960	103,000	327,000	441,000,000	12%	2%	13%
1961	103,000	327,000	441,000,000	12%	2%	13%
1962	103,000	327,000	441,000,000	12%	2%	13%
1963	103,000	327,000	441,000,000	12%	2%	13%
1964	103,000	327,000	441,000,000	12%	2%	13%
1965	103,000	327,000	441,000,000	12%	2%	13%
1966	103,000	327,000	441,000,000	12%	2%	13%
1967	103,000	327,000	441,000,000	12%	2%	13%
1968	103,000	327,000	441,000,000	12%	2%	13%
1969	103,000	327,000	441,000,000	12%	2%	13%
1970	103,000	327,000	441,000,000	12%	2%	13%
1971	103,000	327,000	441,000,000	12%	2%	13%
1972	103,000	327,000	441,000,000	12%	2%	13%
1973	103,000	327,000	441,000,000	12%	2%	13%
1974	103,000	327,000	441,000,000	12%	2%	13%
1975	103,000	327,000	441,000,000	12%	2%	13%
1976	103,000	327,000	441,000,000	12%	2%	13%
1977	103,000	327,000	441,000,000	12%	2%	13%
1978	103,000	327,000	441,000,000	12%	2%	13%
1979	103,000	327,000	441,000,000	12%	2%	13%
1980	103,000	327,000	441,000,000	12%	2%	13%
1981	103,000	327,000	441,000,000	12%	2%	13%
1982	103,000	327,000	441,000,000	12%	2%	13%
1983	103,000	327,000	441,000,000	12%	2%	13%
1984	103,000	327,000	441,000,000	12%	2%	13%
1985	103,000	327,000	441,000,000	12%	2%	13%
1986	103,000	327,000	441,000,000	12%	2%	13%
1987	103,000	327,000	441,000,000	12%	2%	13%
1988	103,000	327,000	441,000,000	12%	2%	13%
1989	103,000	327,000	441,000,000	12%	2%	13%
1990	103,000	327,000	441,000,000	12%	2%	13%
1991	103,000	327,000	441,000,000	12%	2%	13%
1992	103,000	327,000	441,000,000	12%	2%	13%
1993	103,000	327,000	441,000,000	12%	2%	13%
1994	103,000	327,000	441,000,000	12%	2%	13%
1995	103,000	327,000	441,000,000	12%	2%	13%
1996	103,000	327,000	441,000,000	12%	2%	13%
1997	103,000	327,000	441,000,000	12%	2%	13%
1998	103,000	327,000	441,000,000	12%	2%	13%
1999	103,000	327,000	441,000,000	12%	2%	13%
2000	103,000	327,000	441,000,000	12%	2%	13%
2001	103,000	327,000	441,000,000	12%	2%	13%
2002	103,000	327,000	441,000,000	12%	2%	13%
2003	103,000	327,000	441,000,000	12%	2%	13%
2004	103,000	327,000	441,000,000	12%	2%	13%
2005	103,000	327,000	441,000,000	12%	2%	13%
2006	103,000	327,000	441,000,000	12%	2%	13%
2007	103,000	327,000	441,000,000	12%	2%	13%
2008	103,000	327,000	441,000,000	12%	2%	13%
2009	103,000	327,000	441,000,000	12%	2%	13%
2010	103,000	327,000	441,000,000	12%	2%	13%
2011	103,000	327,000	441,000,000	12%	2%	13%
2012	103,000	327,000	441,000,000	12%	2%	13%
2013	103,000	327,000	441,000,000	12%	2%	13%
2014	103,000	327,000	441,000,000	12%	2%	13%
2015	103,000	327,000	441,000,000	12%	2%	13%
2016	103,000	327,000	441,000,000	12%	2%	13%
2017	103,000	327,000	441,000,000	12%	2%	13%
2018	103,000	327,000	441,000,000	12%	2%	13%
2019	103,000	327,000	441,000,000	12%	2%	13%
2020	103,000	327,000	441,000,000	12%	2%	13%
2021	103,000	327,000	441,000,000	12%	2%	13%
2022	103,000	327,000	441,000,000	12%	2%	13%
2023	103,000	327,000	441,000,000	12%	2%	13%
2024	103,000	327,000	441,000,000	12%	2%	13%
2025	103,000	327,000	441,000,000	12%	2%	13%
2026	103,000	327,000	441,000,000	12%	2%	13%
2027	103,000	327,000	441,000,000	12%	2%	13%
2028	103,000	327,000	441,000,000	12%	2%	13%
2029	103,000	327,000	441,000,000	12%	2%	13%
2030	103,000	327,000	441,000,000	12%	2%	13%
2031	103,000	327,000	441,000,000	12%	2%	13%
2032	103,000	327,000	441,000,000	12%	2%	13%
2033	103,000	327,000	441,000,000	12%	2%	13%
2034	103,000	327,000	441,000,000	12%	2%	13%
2035	103,000	327,000	441,000,000	12%	2%	13%
2036	103,000	327,000	441,000,000	12%	2%	13%
2037	103,000	327,000	441,000,000	12%	2%	13%
2038	103,000	327,000	441,000,000	12%	2%	13%
2039	103,000	327,000	441,000,000	12%	2%	13%
2040	103,000	327,000	441,000,000	12%	2%	13%
2041	103,000	327,000	441,000,000	12%	2%	13%
2042	103,000	327,000	441,000,000	12%	2%	13%
2043	103,000	327,000	441,000,000	12%	2%	13%
2044	103,000	327,000	441,000,000	12%	2%	13%
2045	103,000	327,000	441,000,000	12%	2%	13%
2046	103,000	327,000	441,000,000	12%	2%	13%
2047	103,000	327,000	441,000,000	12%	2%	13%
2048	103,000	327,000	441,000,000	12%	2%	13%
2049	103,000	327,000	441,000,000	12%	2%	13%
2050	103,000	327,000	441,000,000	12%	2%	13%
2051	103,000	327,000	441,000,000	12%	2%	13%
2052	103,000	327,000	441,000,000	12%	2%	13%
2053	103,000	327,000	441,000,000	12%	2%	13%
2054	103,000	327,000	441,000,000	12%	2%	13%
2055	103,000	327,000	441,000,000	12%	2%	13%
2056	103,000	327,000	441,000,000	12%	2%	13%
2057	103,000	327,000	441,000,000	12%	2%	13%
2058	103,000	327,000	441,000,000	12%	2%	13%
2059	103,000	327,000	441,000,000	12%	2%	13%
2060	103,000	327,000	441,000,000	12%	2%	13%
2061	103,000	327,000	441,000,000	12%	2%	13%
2062	103,000	327,000	441,000,000	12%	2%	13%
2063	103,000	327,000	441,000,000	12%	2%	13%
2064	103,000	327,000	441,000,000	12%	2%	13%
2065	103,000	327,000	441,000,000	12%	2%	13%
2066	103,000	327,000	441,000,000	12%	2%	13%
2067	103,000	327,000	441,000,000	12%	2%	13%
2068	103,000	327,000	441,000,000	12%	2%	13%
2069	103,000	327,000	441,000,000	12%	2%	13%
2070	103,000	327,000	441,000,000	12%	2%	13%
2071	103,000	327,000	441,000,000	12%	2%	13%
2072	103,000	327,000	441,000,000	12%	2%	13%
2073	103,000	327,000	441,000,000	12%	2%	13%
2074	103,000	327,000	441,000,000	12%	2%	13%
2075	103,000	327,000	441,000,000	12%	2%	13%
2076	103,000	327,000	441,000,000	12%	2%	13%
2077	103,000	327,000	441,000,000	12%	2%	13%
2078	103,000	327,000	441,000,000	12%	2%	13%
2079	103,000	327,000	441,000,000	12%	2%	13%
2080	103,000	327,000	441,000,000	12%	2%	13%
2081	103,000	327,000	441,000,000	12%	2%	13%
2082	103,000	327,000	441,000,000	12%	2%	13%
2083	103,000	327,000	441,000,000	12%	2%	13%
2084	103,000	327,000	441,000,000	12%	2%	13%
2085	103,000	327,000	441,000,000	12%	2%	13%
2086	103,000	327,000	441,000,000	12%	2%	13%
2087	103,000	327,000	441,000,000	12%	2%	13%
2088	103,000	327,000	441,000,000	12%	2%	13%
2089	103,000	327,000	441,000,000	12%	2%	13%
2090	103,000	327,000	441,000,000	12%	2%	13%
2091	103,000	327,000	441,000,000	12%	2%	13%
2092	103,000	327,000	441,000,000	12%	2%	13%
2093	103,000	327,000	441,000,000	12%	2%	13%
2094	103,000	327,000	441,000,000	12%	2%	13%
2095	103,000	327,000	441,000,000	12%	2%	13%
2096	103,000	327,000	441,000,000	12%	2%	13%
2097	103,000	327,000	441,000,000	12%	2%	13%
2098	103,000	327,000	441,000,000	12%	2%	13%
2099	103,000	327,000	441,000,000	12%	2%	13%
2100	103,000	327,000	441,000,000	12%	2%	13%

EVOLUTION OF TERMINAL DESIGN

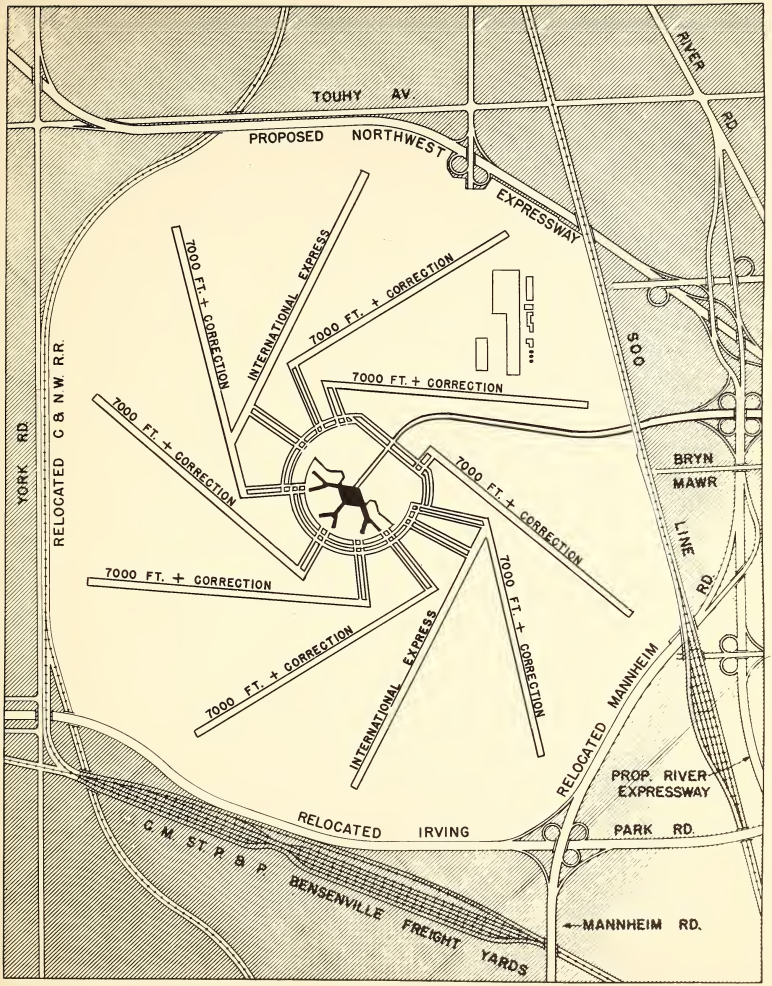

PARALLEL OFF CENTER
PARALLEL
PARALLEL 8 ROWS
THREE FIN
CIRCLE FINGER
RADIAL ARMS & SPLIT FINGERS NO PARKING
'PRODUCTION LINE' METHOD
PASSENGER LOADING UNLOADING AND PLANE SERVICING AT DIFFERENT GATES
PASSENGER MOVEMENTS AND SERVICE TRANSPORTATION UNDERGROUND INSUFFICIENT PARKING
LEGEND
AIRLINE STATIONS
PLANE POSITIONS
'STATIONARY' METHOD
PASSENGER LOADING, UNLOADING AND PLANE SERVICING AT SAME GATE
CIRCLE
OVAL
GROSS
FIVE LOOP
PASSENGER MOVEMENTS AND SERVICE TRANSPORTATION ON GROUND LEVEL INSUFFICIENT PARKING
LOADING & UNLOADING AT SAME GATE
PLANE SERVICING AT ONE GATE
ADAPTABLE TO EITHER 'PRODUCTION LINE' OR 'STATIONARY' METHOD OF LOADING
RADIAL ARMS & SPLIT FINGERS WITH PARKING
IDEAL PARKING
PASSENGER MOVEMENTS ABOVE GROUND LEVEL
SERVICE TRANSPORTATION ON GROUND LEVEL
MASTER PLAN



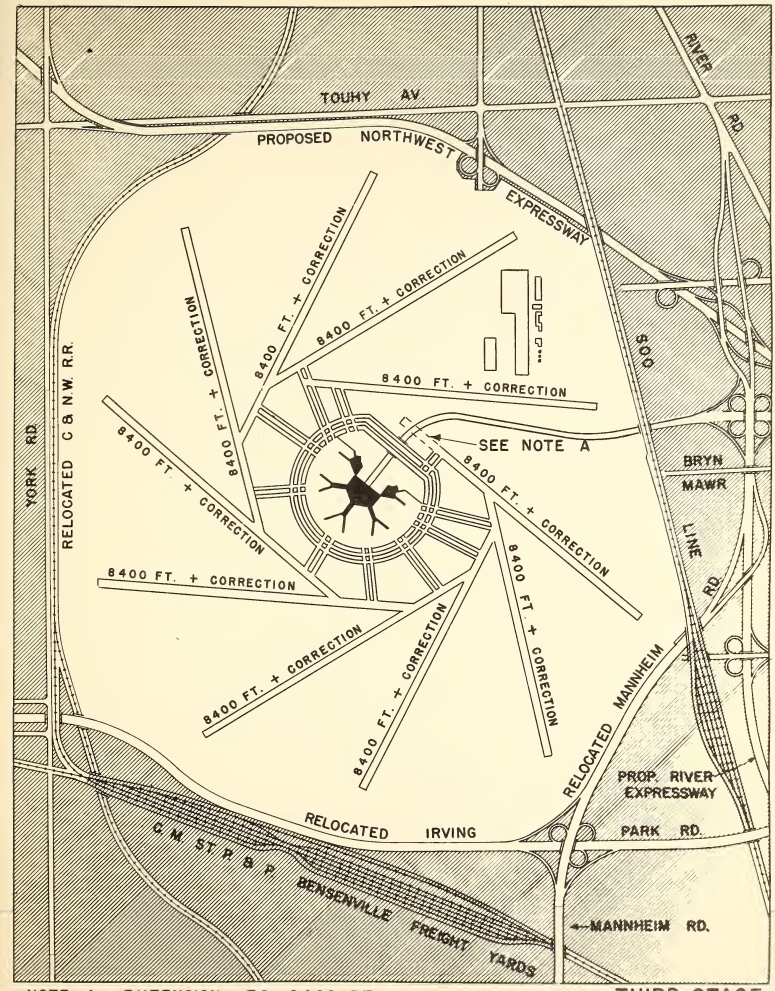
EXISTING CONDITION


TOUHY AV
PROPOSED NORTHWEST EXPRESSWAY
RIVER RD.
SOO
YORK RD
RELOCATED C & N W R.R.
6000 FT. + CORRECTION
BRYN MAWR
LINE RD.
6000 FT. + CORRECTION
6000 FT. + CORRECTION
RELOCATED MANNHEIM
PROP. RIVER EXPRESSWAY
RELOCATED IRVING PARK RD.
C M ST P & P
BENSENVILLE FREIGHT YARDS
MANNHEIM RD.

FIRST STAGE

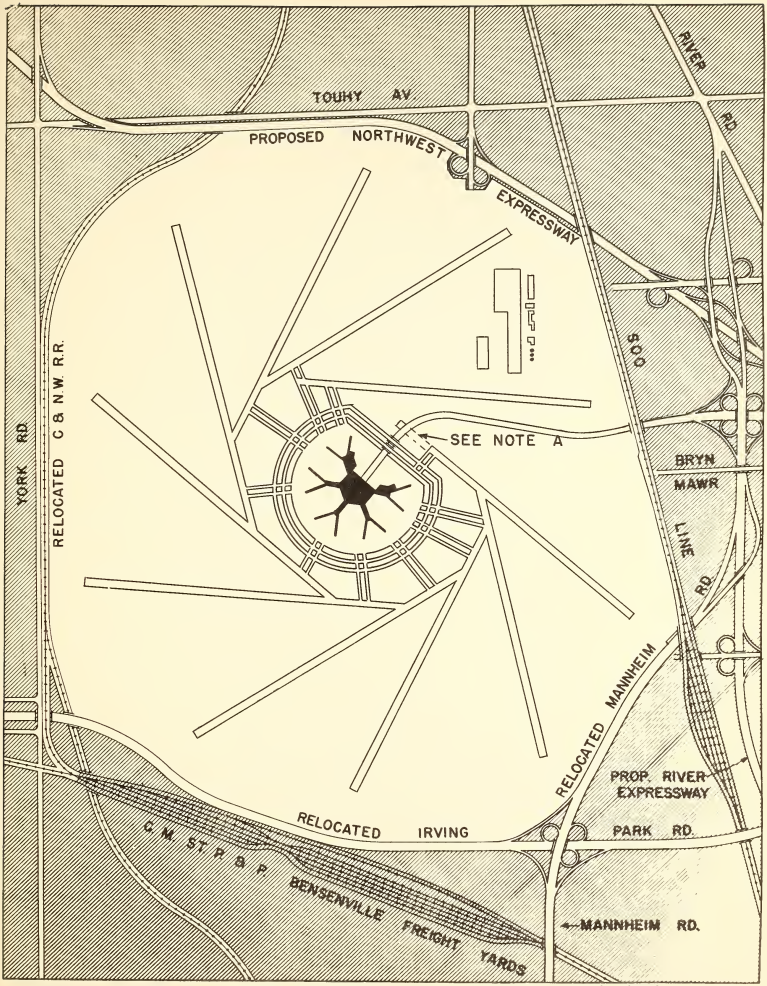


SECOND STAGE



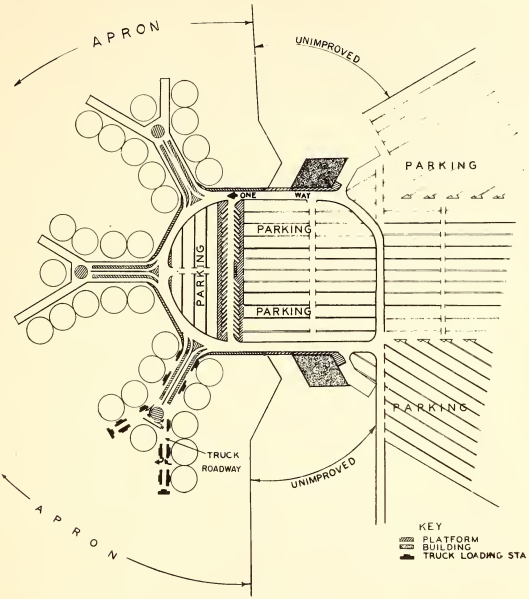
NOTE: A – EXTENSION TO 8400 FT. WILL REQURE RUNWAY BRIDGE

THIRD STAGE

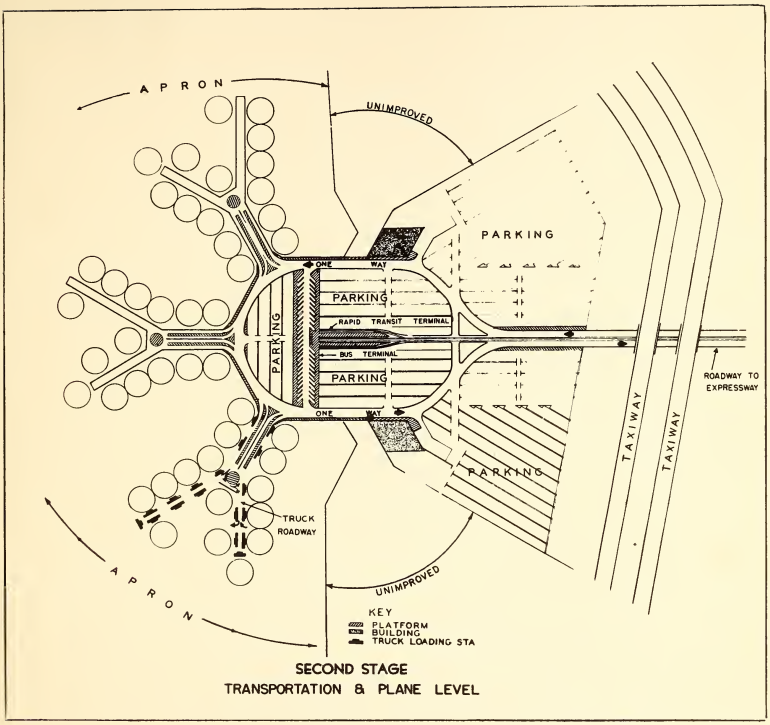


NOTE: A – EXTENSION TO 8400 FT.
WILL REQUIRE RUNWAY BRIDGE

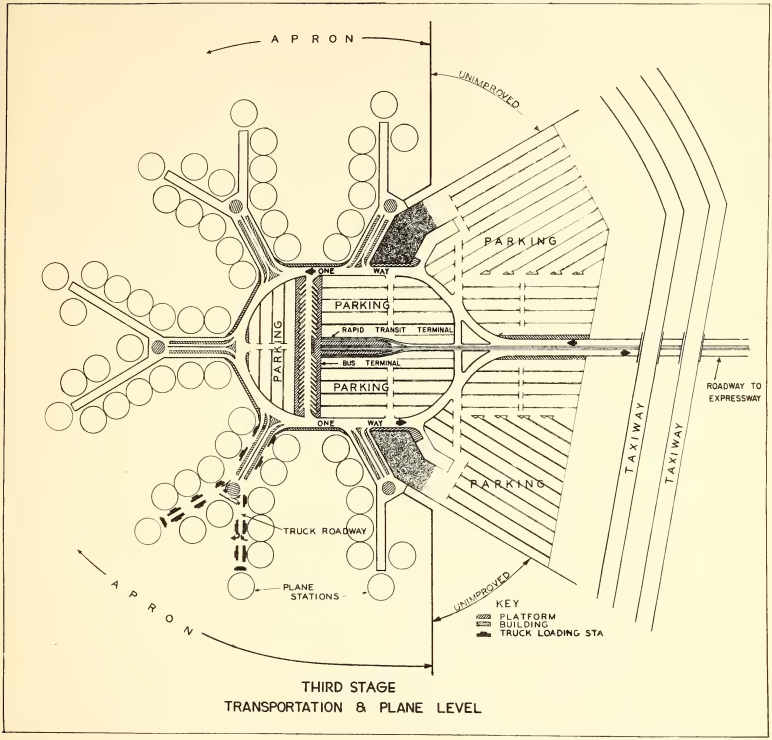
ULTIMATE STAGE



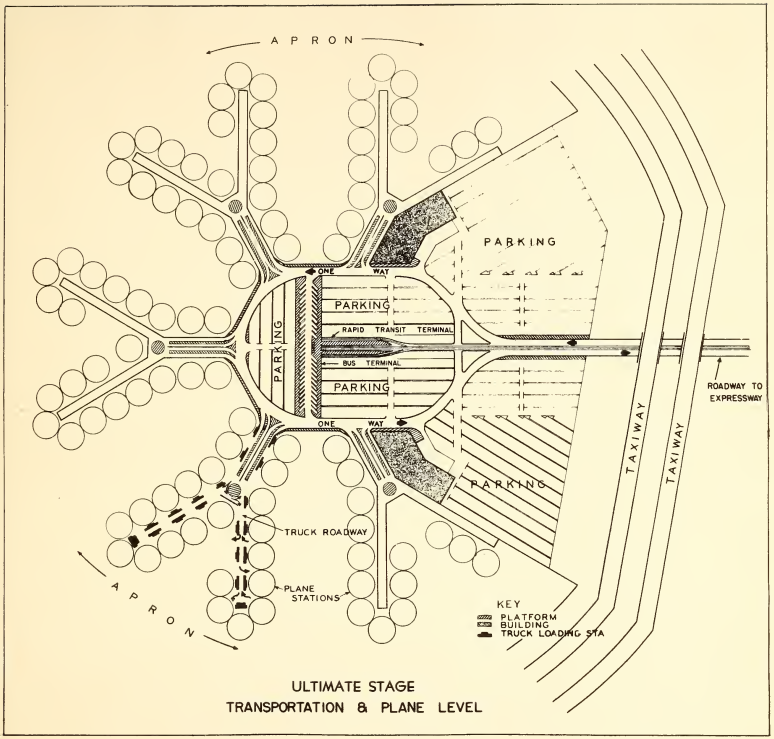
FIRST STAGE
TRANSPORTATION & PLANE LEVEL



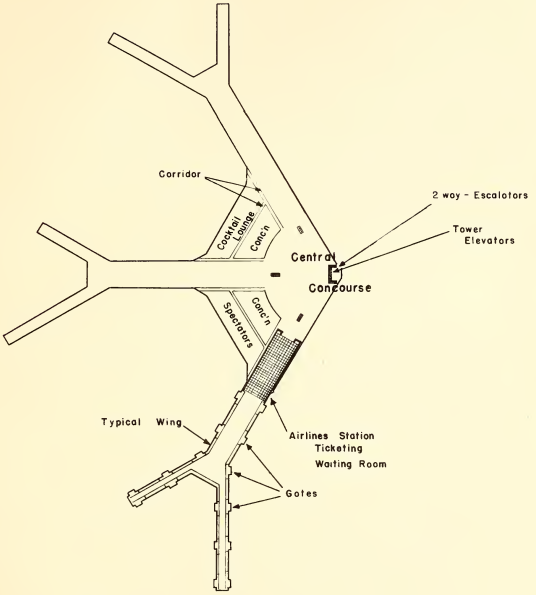
SECOND STAGE
TRANSPORTATION & PLANE LEVEL



THIRD STAGE
TRANSPORTATION & PLANE LEVEL

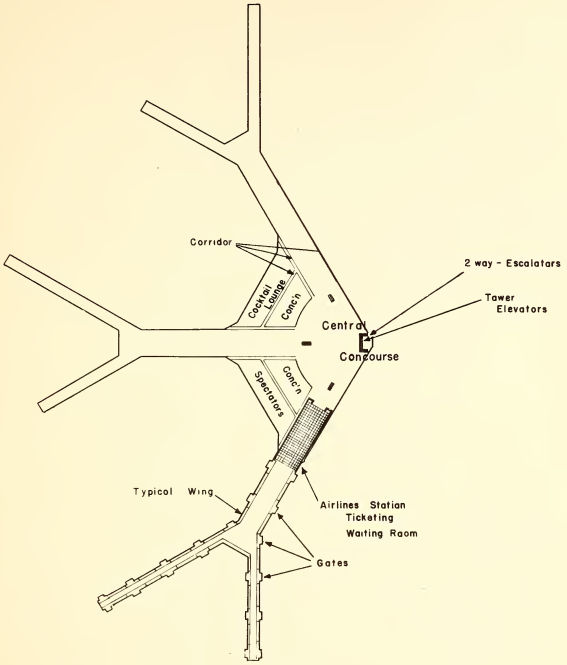


ULTIMATE STAGE
TRANSPORTATION & PLANE LEVEL



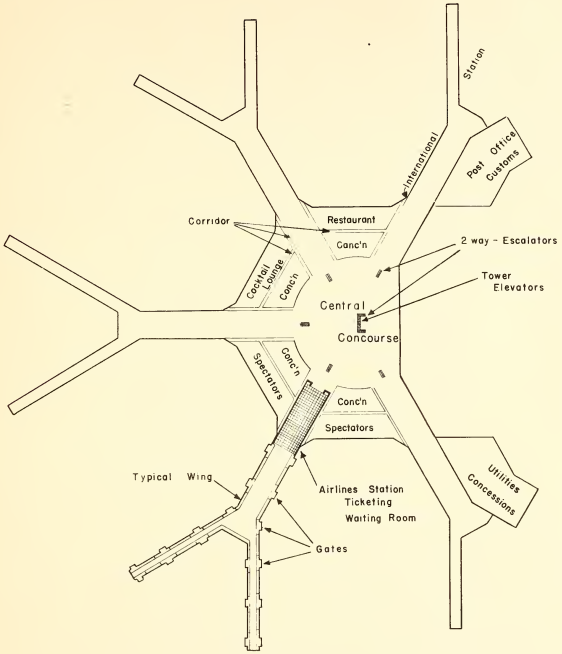
FIRST STAGE

CONCOURSE LEVEL



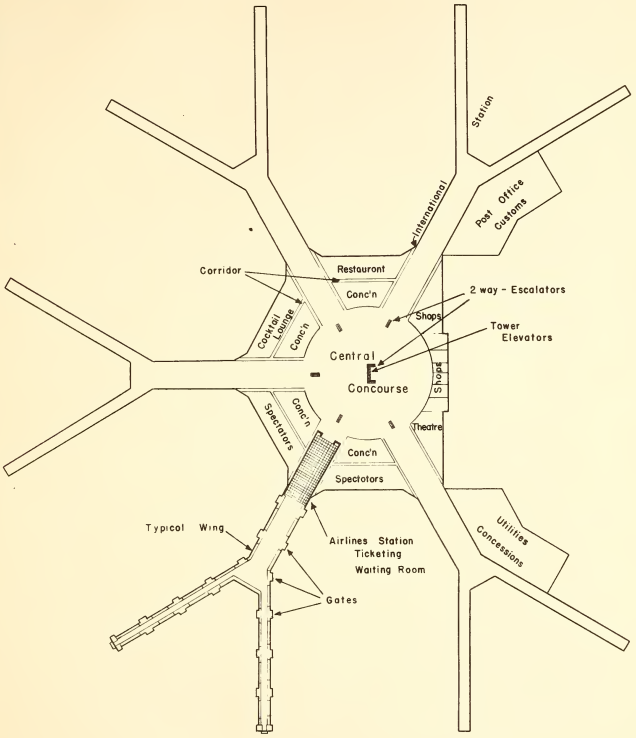
SECOND STAGE

CONCOURSE LEVEL



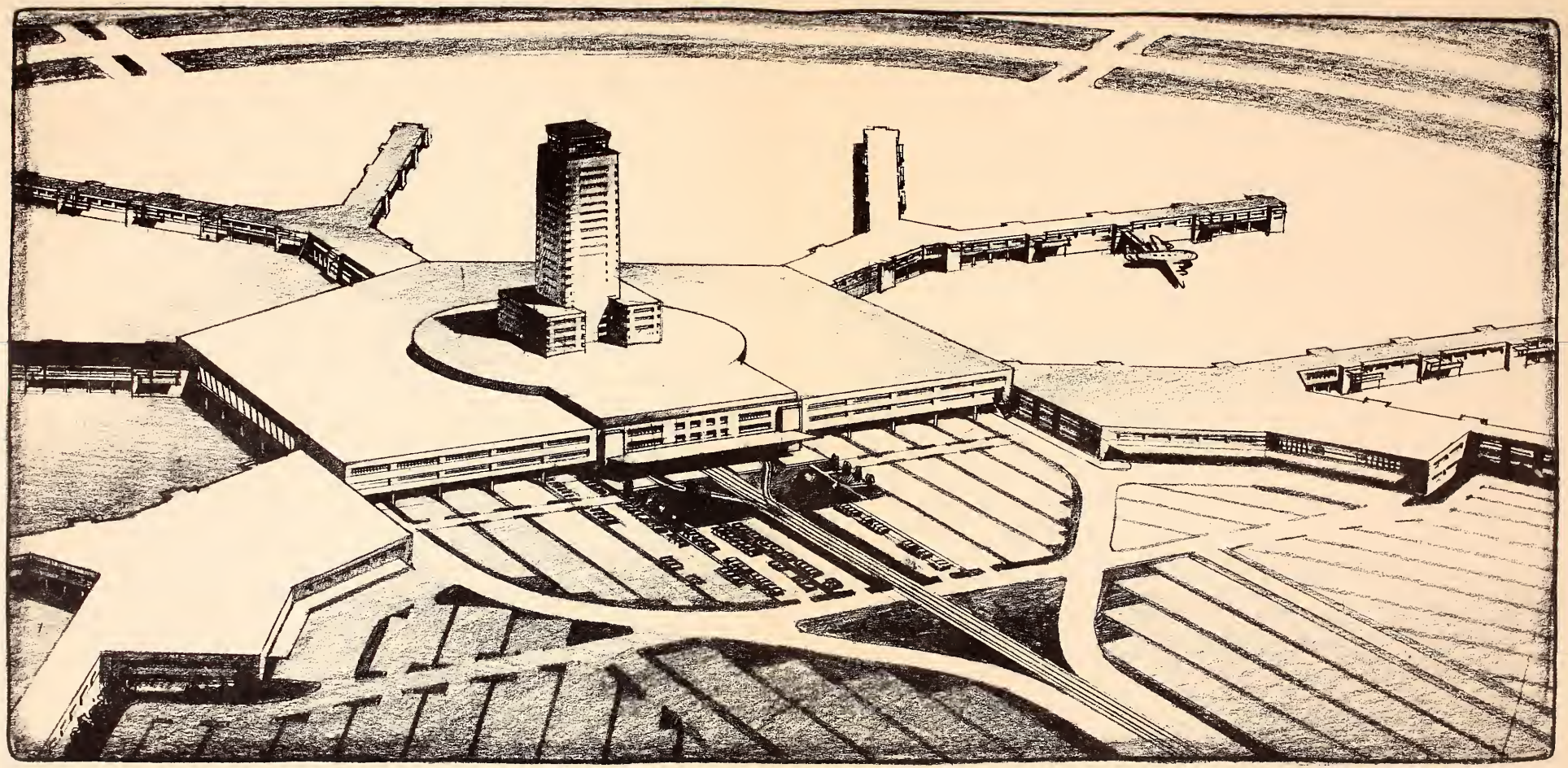
THIRD STAGE

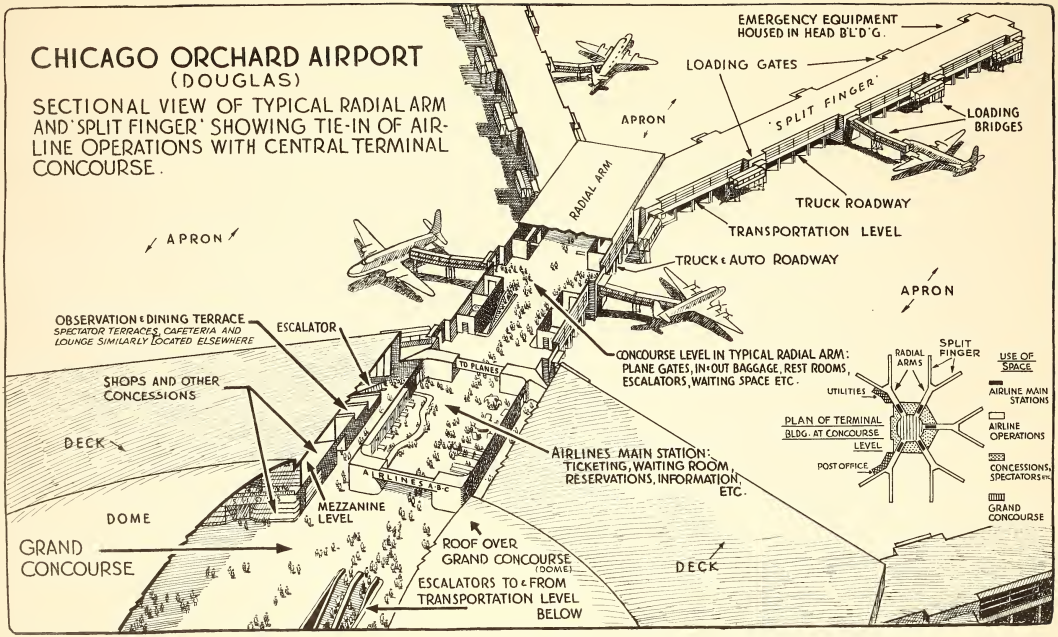
CONCOURSE LEVEL



ULTIMATE STAGE

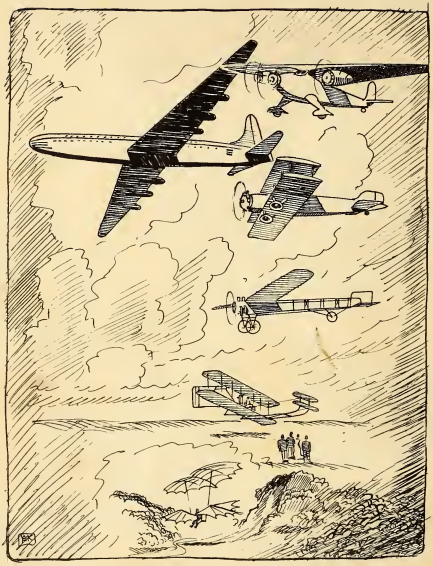
CONCOURSE LEVEL





Bob VanDeman

Acc 5611



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